PEST CONTROL

JANUARY 1956

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Dr. O. W. Rosewall, Chairman of the Department of Entomology and Zoology at Louisiana State University can often be found hard at work in his campus office cataloging insect species. As chairman of the annual Southern PCO Conference, Dr. Rosewall has taken an active part in raising the standards of the industry by bringing together southern PCOs and outstanding authorities on the various phases of pest control. This year's Southern Conference will be held on the LSU campus in Baton Rouge from Jan. 30 to Feb. 1. For dates and complete schedules of other conferences turn to page eighteen.

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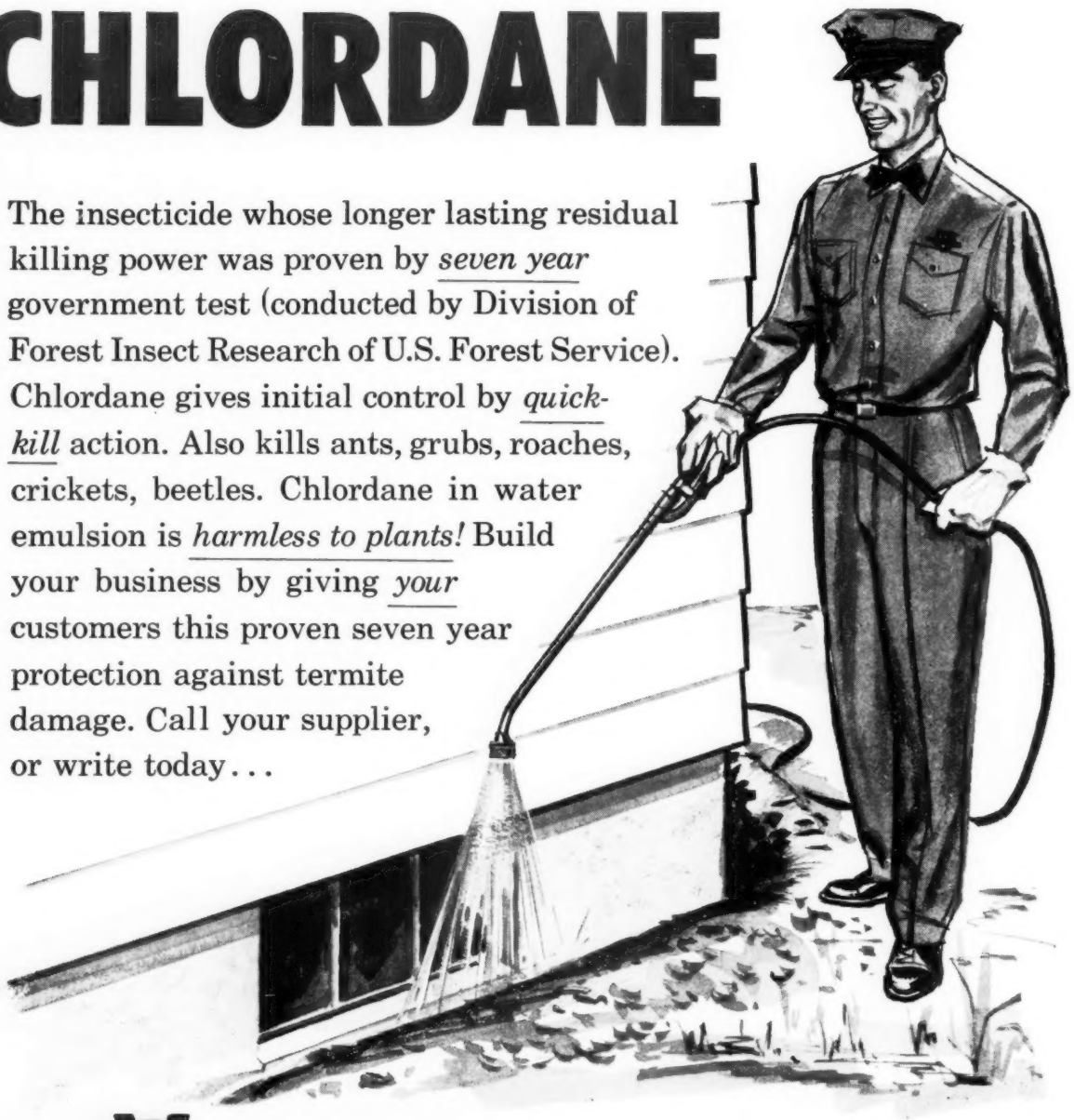

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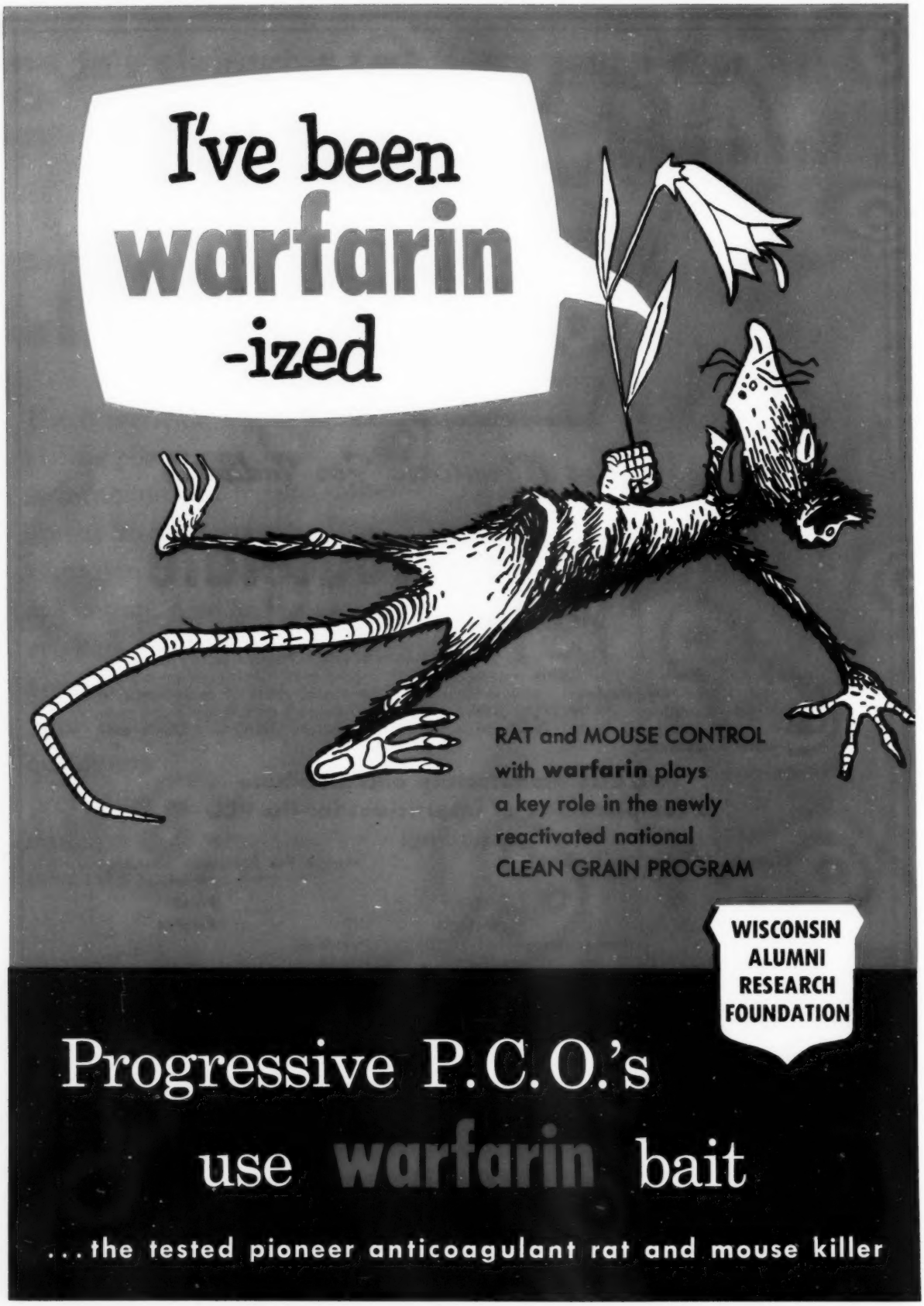
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No Place for Chance-Takers

If subjects are rated in order of their importance to the pest control industry, safety comes first. That's why we feature this topic in our January issue each year. Without vigilant observance of safe practices pest control firms and their servicemen cannot operate successfully.

But rather than a once-a-year subject for your consideration, safety is a day-in-and-out observance that should be as routine as getting out of bed. Servicemen and manager safety refresher meetings should be held at least once every three months to review operational hazards, the toxicity of new chemicals, and to answer questions or report on incidences which have occurred during the previous quarter.

One problem of national concern is the improper disposal of pesticide containers. More often than not they're carelessly thrown out containing an ounce or two of chemical that wasn't drained. Such glass and metal containers are frequently reused by the unwary to hold water that's sometimes meant for drinking. Beside the economic loss from wasting usable residue, the hazard to secondary users is obvious. Containers must first be thoroughly drained of their contents and then either smashed, broken or burned if not returnable. Servicemen should be reminded of this.

Recently, too, deaths have occurred because insecticide has been temporarily stored in bottles that once contained wine, whiskey, or soft drinks. No defense for such defiance of proper safety rules is justified. Pesticides must *only* be stored in their original containers or, if formulated on your premises, transferred to bottles or cans with proper labels which clearly indicate the contents.

Every serviceman should be equipped with his own uniform, a pair of protective gloves, a proper face mask for the service work he's doing, and a cap. We're glad to see more pest control firms outfitting their men with clean uniforms. Not only do they offer protection to their men's own work clothes, but also provide a uniform appearance for company employees and double as a public relations and advertising medium. Protective gloves are more common, too, because long-wearing, durable models are now available. Use of face and mouth masks is on the increase as more service employees realize it's their *own* "skin" they're protecting.

There's no room for the chance-taker when it comes to safety. If you're not sure of the potential hazards, protect yourself against the worst.

PEST CONTROL

EVERY MONTH SINCE 1932

JAMES A. NELSON, Editor — H. B. WILSON, Associate Editor

THEODORE RIEDEBURG, East Coast Representative — R. J. HOFFER, Circulation Manager — KARL HASSLER, West Coast Representative

Volume 24 **JANUARY 1956** **No. 1**

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Letters

Defends 1080

In your November issue's *Letters* section, (page 5) I came across the interesting comments of J. C. Redd, Redd Pest Control, Inc., Jackson, Miss., in connection with the roof rat problem.

It caught my attention when he said roof rats can be controlled with 1080 but that the tendency is to get completely away from 1080. If roof rats can be immediately controlled with 1080, it would be interesting to know the reason for the tendency to keep away from it.

Based on my personal experience, there is no choice to make. Either the rats are controlled with 1080 or we will have to keep operating on a guess-work basis. Too much danger? Maybe, but we have to use it until something better comes along.

We tried countless rodenticides with different types of baits without any success. The only chemical that has given absolute control is 1080.

Frank Reina

Manager
Fumigadora Ideal
Manzanillo, Cuba

Rodent Film Correction

In the August issue of *Pest Control* (page 16), you were kind enough to mention one of our films, *Get Rid of Rats.*

The data given about this film was not quite accurate. Here is the correct information:

> **Get Rid of Rats.** 16mm, 10 minutes, sound. Available for purchase through the National Film Board of Canada, 630 Fifth Avenue, Suite 658, New York, N. Y., for $40. Available for rental through William M. Dennis Film Libraries, 2506½ W. Seventh St., Los Angeles 5, Calif., for $1.50.

If you would be kind enough to print this correction, we would certainly appreciate it.

Gladd Patterson

National Film Board of Canada
New York, N. Y.

Malayan Khapra Beetle

In your September '55 *Letters* column you printed a letter from me in which I stated that the khapra beetle *(Trogoderma granarium)* was not found in Malaya until recently. It is surprising to hear from you that this beetle was listed as long ago as 1898 as a Malayan pest as it has never been recorded elsewhere here prior to 1954 and no specimens were in our 30 year old collection until last year.

I have checked Hintons' 1945 record and propose to follow this up. As a matter of interest, when this beetle was described as *T. khapra* by Arrow in 1917, its distribution in Asia was given only as India. Our local infestation in one godown has been completely cleared up.

R. A. Lever

Senior Entomologist
Department of Agriculture
Kuala Lumpur,
Federation of Malaya

Insurance Postscript

We have just read the article on "Insurance Needs for the PCO", (December '55, p. 12) and think that it is very well written.

There is just one point we would like to make. All liability insurance policies which are written through this office carry the classification of exterminating, including completed operations. This has been accomplished after our many years of experience with the pest control industry, since we know that coverage has to be afforded while the work is being performed and after the insured or his employees have left the premises where such work has been performed. By including completed operations in all of our classifications, which also by the way is the same for fumigating, we obviate the need for products liability insurance as it relates to the actual operations performed by the PCO. If the classification did not include completed operations, it would be necessary for all PCO's to purchase products liability insurance, so that coverage would be afforded after they leave the premises of their cus-

(Continued on page 50)

Pest Control welcomes expressions of opinions from its readers. Send ideas and comments as briefly as possible to James A. Nelson, Editor, Pest Control, 1900 Euclid Avenue, Cleveland 15, Ohio.

How PAUL K. ADAMS of Alexandria, Louisiana

CONTROLS RESISTANT ROACHES

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"By no means do we feel that Malrin is a panacea, but we have found that when properly applied, we are able to get more lasting control of resistant roaches with it than any other liquid insecticide we have used.

"Resistant fleas were quite a headache with us also. As a matter of fact, in late 1954 we actually lost money on most of our flea jobs, as a result of the numerous recalls we had to make. We used everything in the book on them and still, in many cases, cold weather is what finally stopped them. Early this year, we began using Malrin on them and have reduced our recalls to less than one-half of one per cent.

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Paul K. Adams

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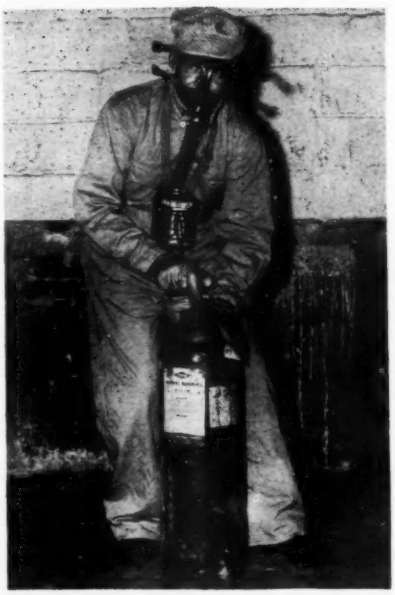

Orkin serviceman models clothing designed for protection during fumigation job. Cap and coveralls protect body. Chemical-resistant gloves cover hands and safety shoes guard feet. Mask prevents operator from breathing toxic fumes. Photo through the courtesy of "Orkin Talkin."

How Toxic Are Today's Pesticides?

by JUSTUS C. WARD

Assistant Head, Pesticide Regulation Section
U. S. Department of Agriculture, Washington, D. C.

Based upon a talk presented at the 1955 NPCA convention

An Authoritative, Tabulated Report on Toxic Properties of Common Insecticides and Rodenticides

PESTICIDES are in that class of toxic chemicals whose values can be utilized with reasonable safety when scientific knowledge and good judgment are combined.

A few short years ago, an informal discussion of the toxicities and hazards of the chemical working tools used by structural pest control operators would have been limited to rather incidental comments on a few products known principally for their effectiveness. This is no longer true, since an attempt merely to list the pesticides used by servicemen is a difficult job. As a consequence, this summary will include typical examples of those poisons which are believed to be of outstanding importance to this industry.

To introduce any discussion on the basic toxicity of a number of pesticides, it is usually necessary to refer to data obtained by different laboratories over several years. In addition, to interpret the practical significance of any tabulations, it is also essential to remember that most pharmacological data is obtained only on the chemical itself. Many times this means that the danger of using a formulation is not forecasted too accurately by the toxicity of the poison which it carries.

Except where noted, the tabulations are compiled from data obtained in the Food & Drug Administration, Pharmacology Division Laboratories and published by Dr. A. J. Lehman* in 1951 and 1952.

TABLE I
Acute Oral Toxicity To Laboratory Rats

INSECTICIDES			
Sodium arsenite	14 mg./kg.		
Pentachorophenol	78 " "		
Dieldrin	87 " "		
Lethane 384	90 " "		
Lindane	125 " "		
Diazinon	100-150 " "		(1)
Sodium fluoride	200 " "		
Pyrethrins	200 " "		
DDT	250 " "		
Lethane special	400 " "		
Chlordane	457 " "		
Malathion (in corn oil)	479 " "		(1)
Bayer L 13/59 (Dipterex)	400 " "		(3)
Lethane 60	500 " "		
BHC	600 " "		
Allethrin	680 " "		
Thanite	1000 " "		
Malathion	1400 " "		(1)
Methoxychlor	6000 " "		
Perthane	8170 " "		(2)
RODENTICIDES			
Sodium fluoroacetate (1080)	1.7 " "		
Antu (Alpha naphthyl thiourea)	6 " "		
Strychnine alkaloid	16.2 " "		
Arsenious acid (As_2O_3)	13 " "		
Thallium as sulphate	25 " "		
Zinc phosphide	80(4)-450 " "		
Pival	100 " "		(5)
Warfarin	160-300 " "		(5)
Fumarin	200 " "		(5)
Tomarin	more than 400 " "		(5)
Red Squill	500 " "		(5)

(1) Hazelton, Personal communication
(2) Haag, " "
(3) Bayer, " "
(4) Ward, " "
(5) Leary & Ligon, Personal communication

It is apparent that from the acute, oral toxicity viewpoint, the insecticides themselves will vary all the way from 14 mg./kg. for sodium arsenite to rats up to 8170 mg./kg. for perthane. Also, the rodenticides on the same basis run in toxicity from 1080 at 1.7 mg./kg. to red squill at 500 mg./kg.

Since these products have established themselves as effective pesticides, it would appear that high acute mammalian toxicity is not essential, even in satisfactory animal poisons.

• Skin Absorption Dangers

Oral toxicities provide one basis for the comparison of toxic agents, but for the pest control operator's personal protection the matter of skin absorption is of equal, if not greater importance. Tables II and III give some comparison of value in trying to forecast danger from single massive exposures or from continu-

* Quart. Bull. Assn. Food & Drug Officials XV, No. 4, 122-33 (1951)
XVI, No. 1, 3-9 (1952)

TABLE II

Single Dose Dermal Toxicity To Rabbits

Lindane (in vanishing cream)	50 mg./kg.		
Dieldrin	less than 150	" "	
Lindane (2% in dimethyl phthlate)	more than 188	" "	
Diazinon (in Xylene)	180	" "	(1)
Chlordane (20% in dmp)	less than 780	" "	
Pyrethrins (20% in soybean oil)	more than 1880	" "	
BHC (20% in dmp)	more than 1880	" "	
DDT (30% in dmp)	more than 2820	" "	
Lindane powder	more than 4000	" "	
DDT powder	unobtainable		
Perthane powder	"		
Methoxychlor powder	"		
Malathion	2460-6150	toxic	(2)
Lethane 384 (50% in petroleum distillate)	0.25-0.5	ml./kg.	
Lethane Special	1.0	" "	
Thanite	6.0	" "	
Lethane 60 (50% in petroleum distillate)	10.0	" "	

(1) Wayland Hayes, Personal communication
(2) Hazelton, " "

TABLE III

Multiple Dose Dermal Toxicity to Rabbits

		Survivors after daily doses
Dieldrin	less than 5 mg./kg.	None-14
Lindane	50 " "	None-2 to 9
Chlordane	40 " "	None-10 to 20
DDT	300 " "	None-14
Thanite	less than 1 ml./kg.	None-5
Lethane 60	less than 1 " "	None-5
Lethane 384	0.1 " "	LD 50-8 doses/21 days
Lethane 384 Special	0.5 " "	LD 50-8 doses/21 days

TABLE IV

Computed Comparative Toxicities To Man Of Several Commonly Used Rodent Baits

Poison	Highest Concentration Commonly Used in Bait	Estimated Lethal Dose of Poison in mg./kg.	Amount of Bait Needed to Kill 150 Lb. Man
Arsenic trioxide	3 % (1 part in 33 parts)	1.5-15.0	0.12-1.2 oz.
Strychnine alkaloid	0.3 % (1 part in 320 parts)	1.0	0.8 oz.
1080	0.4 % (1 part in 256 parts)	2 0	1.26 oz.
Thallium sulphate	2.0 % (1 part in 50 parts)	20 0	2.40 oz.
Zinc phosphide	5.0 % (1 part in 20 parts)	40 0	1.95 oz.
Barium carbonate	20.0 % (1 part in 5 parts)	800 0	9.9 oz.
Antu	5.0 % (1 part in .20 parts)	Unknown	Probably very large
Anticoagulants	0.05% (1 part in 2000 parts)	Characteristics of these poisons prevent any useful estimates	

ous or repeated skin contacts with small doses. From the incomplete evidence available in these tables, it seems that single doses of lindane in vanishing cream would likely be most dangerous, while powdered DDT, methoxychlor or perthane would be least. Multiple exposure records would place dieldrin in the most toxic place and Lethane 384 Special as the least toxic product of those tabulated.

This information is of direct value primarily to those PCOs who handle the pure or technical pesticides. Of considerably wider significance would be a complete tabulation of the toxicities of repeated or long continued exposure to the low percentage formulations used by the serviceman or available for unrestricted handling by the housewife. The almost endless variations in commercial mixtures, together with the differences in methods of use at present, make such a tabulation an impossibility. That the so-called "chronic poisoning" is likely to be different from the acute is prophesied in the revealing study on multiple dermal toxicity to rabbits summarized in Table III.

Many efforts have been made to determine the probable practical hazards of using different poison mixtures, and the results of one such study are shown in Table IV.

Here it would seem that a basic point may have been made—it is not always the most toxic chemical in the laboratory which has the greatest potential risk in use. The principle shown here in the calculations for a series of rodenticides has been applied to other pesticides as well. Unfortunately, this form of arriving at the potential hazard of a given pesticide does not work under practical conditions, and sometimes a poison may prove to be either worse or better than the calculations would forecast.

The broad problem of safety evaluation of a pesticide, however, must include consideration of the possible danger to persons, pets, livestock or useful plants which have been exposed to the poison during its application or that will have to stay in the treated areas. Laboratory type data is not too useful in solving this problem. As a consequence, practical use experience, vital statistics, accident records, and medical diagnosis must be consulted.

It is a serious fact that favorable information on the use of pesticides is almost entirely lacking, whereas there is a rapidly increasing mass of information that tends to emphasize the hazards of poisons in general. For example, in 1952 the record showed 1440 deaths caused by accidental poisoning from solid or liquid substances, which is larger than the combined deaths from diphtheria, smallpox, whooping cough, scarlet fever, malaria, typhus and typhoid fever in that same year. This is a bad situation since the ratio of non-fatal to fatal accidents is almost 100 to 1. That means that in 1952 the United States had over 145,000 poisonings, the majority of which must have been unnecessary.

In fairness to pesticides it must be emphasized that they cause a minority of the cases included in these totals. More home accidents occur from the ingestion of drugs and household chemicals, which do not have precautionary labeling, than from the labeled poisons. Regardless of that fact, poisonings should be stopped, and the accident records must improve if further restrictive legislation is to be proved unnecessary.

Each manufacturer, formulator or user of a poison must recognize that he has an increasing responsibility to his customers, and the general public as well as to himself. It is no longer enough to be able to point backward with pride to a record free of undue accidents, encouraging as that may be, since now it is necessary to be able to point forward to an intelligent system of poison handling which will insure that the record will be kept clean.

• Proficiency A Must

Pest control has become an exacting profession in which the need for a better knowledge of the "tools of the trade" is obvious. No operator should be sent out with a service kit containing such varied items as 1080, thallium, dieldrin, lindane, chlordane, DDT, arsenicals, chlorinated phenols, thiocyanates or any

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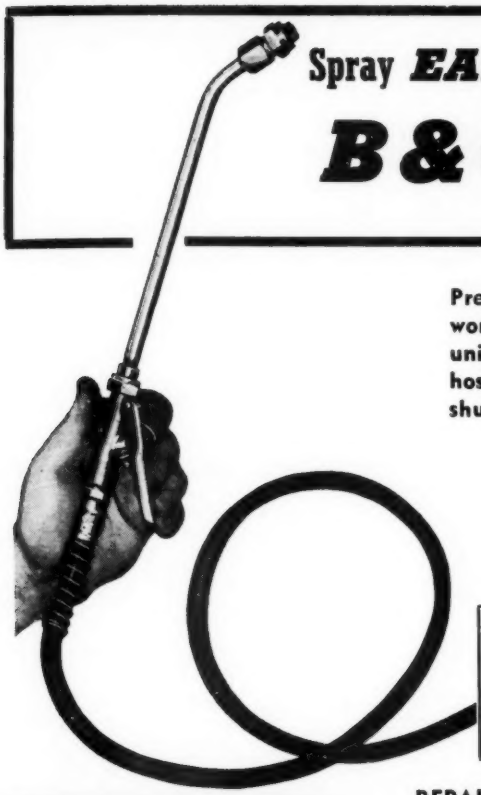

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No defense can be brought to help PCOs who ignore accepted, recommended chemical dosages and concentrations and who become involved in an accident

number of other chemicals without knowing a good deal about the safety factors that must be used in handling them.

From his own personal viewpoint, the PCO should know how to protect himself against chronic hazards as well as acute danger. This means he must use care to keep from breathing, swallowing or absorbing poisons through the skin. For many products this may mean wearing masks or respirators, goggles and protective clothing, even though to do so may be uncomfortable. He must realize that temporary inconvenience is better than risking a long, insidious illness, or an early death from an undiagnosed cause. Being careful with poison is not a sign of cowardice.

From the customer and general public viewpoint, the PCO must know enough about his pesticides to be in a position to choose the one best fitted to the environment in which it must be exposed. The likelihood of injury varies with the conditions, and where danger is high, the poisons used must be correspondingly low in inherent toxicity, even at the risk of less effective control of the pest. Where the chance of trouble is remote, stronger and more satisfactory poisons are appropriate. One further point is worthy of emphasis. Frequently, a highly trained serviceman can use more dangerous poisons with acceptable safety, whereas an inexperienced one can not do so.

- **Must Be "Jack of All Trades"**

In addition to knowing his own job, an operator has to learn a little about a number of others. It is becoming important for him to know something about how accident victims should be treated, if injured by the new poisons he handles. He should also know where to go for the best medical advice on antidotal procedures. Often the physician called in on a case is unfamiliar with the products involved and the PCO may aid him by knowing where to get the most effective advice.

Further, the serviceman applying poisons in outside areas must become somewhat of an engineer. He must know whether or not the poisons being used will leach into the subsoil and travel in ground waters to contaminate wells, streams, ponds, lakes or other water used by humans or livestock. He must learn whether or not the volatile poisons he uses will penetrate barriers and contaminate the atmospheres in the living quarters above.

Then he must be aware of the danger his poisons carry for nearby shrubbery, for pet fish, or for persons, including children, who might work or play in treated areas.

All of these skills are becoming more important as the high dosage use of persistent agents increases, such as in extensive termite-proofing of homes. Caution requires that common sense be used anytime high doses of persistent poisons are involved.

Although the use experience of the pest control industry has been reasonably good, it can and must be improved. When proper precautions in employing and storing poisons are followed, it is obvious that hazards can be reduced, and toxicity will be determined in the laboratory only, rather than as now is being done by a combination of laboratory data and accident records.

Poisons need not be feared, but they must be respected. "Safety First" is now as sound a principle for persons dealing with pesticides as it was a useful slogan for protection of the public at railroad grade crossings.

Klein Wins Match Book Award

Klein Pest Control, Inc., of Milwaukee, Wis., has been voted the "Joshua" award for the most distinguished use of match book advertising in the pest control field during 1955.

A panel of judges representing national advertising and marketing groups selected the "Killer Klein" black match cover with its slogan, "murder is our business," as the most effective promotionally in any consumer industry. The award winner was picked because of its unusual and attention getting approach followed up by a business-like statement of the pest control services offered.

The "Joshua" award is named for the inventor of match books, Joshua Pusey.

"You're too late. My husband got one of those 'do-it-yourself' kits!"

AERO* HCN DISCOIDS —most generally used fumigant for pest control

When you fumigate large enclosed spaces, you'll find AERO HCN DISCOIDS simplest and best. DISCOIDS are thin cellulosic discs saturated with commercially pure hydrocyanic acid, and are simply scattered from the can. No dirt or mess in application or clean-up. Fast, thorough destruction of insects and rodents. For fumigation of dwellings, industrial buildings, railroad cars, ships, stored commodities, DISCOIDS are the fumigant most generally used by PCO's. Reason why? They've been proved best!

On your next fumigation job—make it Discoids!

*Trade-mark

TO KILL FLIES . . . MALATHION is the *preferred* insecticide. Controls resistant species, kills fly maggots, too. Quick knockdown *plus* three weeks or more residual kill. Recommended for fly control by all 48 states. Use as spray or dry bait. Also controls nearly *all* insect pests on ornamentals.

TO KILL RATS OUTDOORS . . . Use CYANOGAS® A-Dust—the ideal fumigant for effective, economical rat control. Not a bait—no residue hazards. Efficient, economical, easy to use.

Write today for free descriptive literature.

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Servicemen, managers, owners all bear the responsibility for accident prevention:

SAFETY is everyone's job!

by
GEORGE SETH
Mine Safety Appliances Co.
Pittsburgh, Pa.

IT HAS BEEN SAID that man does not have to be "told" as often as he must be "reminded." Because of this fact, many companies employ a safety engineer to find new and interesting ways of reminding workers how to do their jobs safely.

The very nature of a pest control operator's work and the size of his company may not justify a full-time safety supervisor. Therefore, it becomes necessary for each employee to work safely without supervision and, where there are several working together, to remember that he is his "brother's keeper."

• Safety "Reminders"

Space forbids the detailing of a complete safety program, but here are some of the "reminders" which can help an operator to plan his job in safety. Pesticides probably offer the greater hazard because they vary so widely in their effect on the human system and among individuals. A PCO cannot know enough about the materials he handles.

A primary admonition is always to "Read the directions carefully!" See what the label has to say about toxicity of the contents, and learn what the antidotes are. The fact that you know the exact toxicity of a material and the antidote for it may save someone's life, perhaps your own. The futility of looking through a trash can for an empty container so that you can find an antidote when an emergency arises is overwhelming. But even better than antidotes are precautions. The recommended respirator, one which offers complete protection against the hazards of the particular material, should be determined beforehand and made ready for use.

• Manufacturers' Instructions

The day has long since passed when manufacturers covered up the fact that their products were toxic. One manufacturer today even points out that his product is extremely dangerous if employed without proper safeguards, and suggests that a local physician be consulted before the material is applied so that the doctor can tell the PCO the symptoms, treatment, and antidote to be used if anything goes wrong. At the same time, the manufacturer specifies certain respiratory protection which he has already determined will afford complete protection. Finally, he describes the personal hygiene steps to be taken after using his product.

With such careful instructions available accident prevention should be easy, and it certainly would be if all users followed them. Unfortunately, all do not. We will always have to contend with what physicians call "the idiosyncracies of p a t i e n t s." Translated for our purposes, this characteristic can be illustrated by the worker who believes that because one operator did a job without proper safeguards and equipment and got away with it, he can too.

The U. S. Government has established a special organization, the Interdepartmental Committee on Pest Control, which serves as a clearing agency for the approval of respiratory protection equipment used in handling pesticides. Followed carefully, the recommendations of this committee and those of the Bureau of Mines; which also publishes a list of Bureau approved chemical cartridge, dust and mist respirators, gas masks, and oxygen breathing apparatus; can keep PCOs out of trouble. But breathing protection, important as it is, isn't always enough. Pesticides of certain types can enter the body in other ways. Some do their damage by entering the skin, by surface absorption, or by ingestion.

In applying insecticides, we are concerned with the form in which they are used. There are gases, vapors, the so-called smokes, fogs, and dusts. Extra care must be taken with those which are dust that hydrolizes with moisture in the air to form a gas. Cyanide discoids and powder will do this and make a liability of a perfectly adequate dust respirator. These form deadly hydrocyanic acid gas, and the ordinary dust respirator is useless against it.

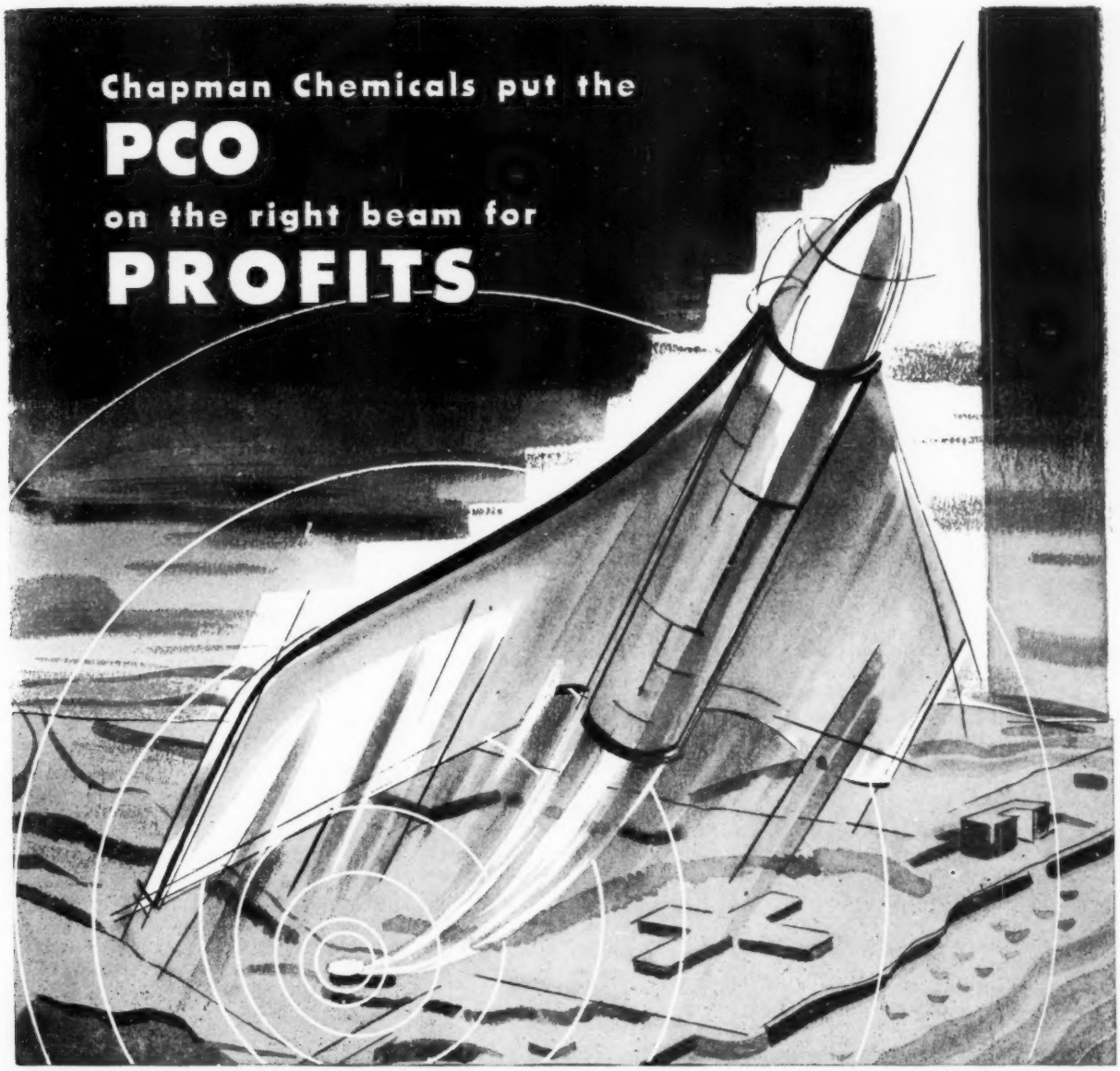
• Carriers, Solvents Can Be Toxic

Sometimes the carrier or solvent can be more deadly than the insecticide for which it is a vehicle. Beware of the carrier which volitilizes to cause an oxygen deficiency in a confined space, or which can cause an explosive mixture with air in the presence of pilot lights, defective electrical switches or sparking electrical equipment.

The National Pest Control Association has carefully screened out certain types of pesticides, especially for indoor use. But the immunity developed by some insects has necessitated the use of potent materials banned in the past. These can be used with proper protection, but extreme care is a must. For example, operators today are using organic phosphates. These are readily absorbed through the skin and their effect is cumulative. They were developed by the Germans during World War II as nerve gases. Complete knowledge of the gases, the effect they have and proper respiratory and body protection is essential to their safe use.

• Other Safeguards

The application of many finely divided chemical particles in present day insecticides has called



JANUARY IS THE TIME FOR:

CHLORDANE-8:
8 lb./gal. Emulsifiable Chlordane for termite and general pest control. 55, 30 and 5-gallon drums; four 1-gallon bottles.

CHAPMAN ROACH AND PEST KILLER:
20% Chlordane Concentrate for oil dilution. General pest control. 55, 30 and 5-gallon drums.

LINDANE 20% EMULSIFIABLE:
20% Lindane in emulsifiable form for general pest control. Can also be used for oil dilution. 5 gallon cans or four 1-gallon bottles.

PERMATOX A CONCENTRATE (1-10):
40% Pentachlorophenol Concentrate. Non-blooming and paintable. Dilute with oil or spirits. Wood preservation and powder post beetle control. 55, 30 and 5-gallon drums.

Low operating costs mean extra profits. That's where Chapman's dependable results make you money. Chapman Pest Control Chemicals are Quality-Controlled . . . help you do a job *right*, the first time.

And—jobs done *right* net you satisfied customers . . . give you a good reputation.

Get on the beam for more profits in '56 . . . put money in your pocket and new business at your door!

If you do not have your copy of Chapman's "BUYER'S GUIDE AND HANDBOOK" of technical information and Chapman's "PCO PROMOTION PLAN" to get new business, write today:

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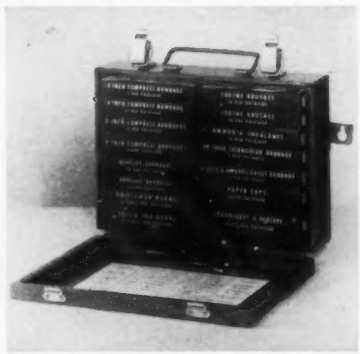


Unit type first aid kit should be part of every operator's equipment. 16 unit kit above is one of models available to PCOs.

for highly efficient filters. There is little point in kidding ourselves. A piece of gauze or a cloth over one's nose and mouth just can't afford the proper protection against such finely divided particles. Know dust respirators and what they can be expected to do. Use government approvals as guides. Don't get in trouble and hospitalize personnel because you didn't use approved equipment. Have a government standard to back your choice of equipment made by reliable manufacturers, who know from careful research and long development what is proper for your job.

If you must work in confined spaces, be sure you have sufficient oxygen there to support life. A simple flame safety lamp will tell you this. In confined spaces, the concentration of gases can become too high for chemical cartridge respirators which are usually approved for concentrations not in excess of 0.1% by volume. In these cases, gas masks with proper canisters are needed, for these are approved for concentrations as high as 2% in air. If there is not sufficient oxygen present, it is necessary to wear self-contained breathing apparatus which furnishes breathable air or oxygen regardless of surrounding atmosphere.

Many operators are allergic to certain pesticides and need protective clothing and gloves. Some pesticides can even penetrate synthetic rubber and with these only natural rubber gloves and covering should be used.

• Barrier Creams Available

Other pesticides, classified as nuisances which cause mild dermatitis, itching, and other skin ailments, call for barrier creams. These creams, which are now available, have been developed for application directly to the skin. They offer complete protection against milder chemicals and are easily removed with soap and water when no longer needed.

82 years "young" and still active is

Granville E. Cooper

Back in 1935, at the age of 62, an age when most men are thinking of a fishing pole and small cottage in Florida, Granville E. Cooper founded a pest control business in Pittsburgh, Pa. Today, despite the fact he's now past four score and two, Mr. Cooper goes about his daily work trouble-shooting, servicing, and selling for his firm, G. E. Cooper Associates, Inc.

He also manages to keep up-to-date on latest industry developments by attending "back-to-school" courses such as the annual PCO Conference held at Purdue. A past president of the Pest Control Association of Western Pennsylvania, he is also a member of the National Pest Control Association.

Before organizing his own firm 21 years ago, Mr. Cooper was a salesman for Keystone Chemical Co. of Cleveland, Ohio. However most of his younger years were spent in the haberdashery field.

Even though his growing business keeps him on the move, this PCO still finds time to enjoy his family of four children, six grandchildren, and one great grandchild.

Barrier creams, like those shown here, reportedly offer good protection against mild dermatitis caused by certain pesticides.

No operator should be without a good first aid kit of the unit type furnished with 10, 16, 24, and 36 units in weatherproof metal containers. These offer handy, economical ways to keep such equipment at every job site. The kit should contain bandages, a tourniquet, eye dressings, and for those sections where a PCO and rattlesnake might be inspecting the same termite job, a snake bite kit. Other special units are available.

Many people believe fumigation is coming back. This kind of operation requires an industrial-type gas mask with a canister for the minimum in respiratory protection. A new canister should be used in "shooting the premises," and another one in ventilating. A few dollars for a fresh canister costs less than flowers and is more conducive to a good night's sleep.

Look back over last year and think, for a minute, of the unsafe practices of which you may have been guilty. Plan to check your equipment, to replace worn or unsafe parts. Take an off-day this winter, when the weather is "not fit for man nor beast," and clean up your respirators and masks with soap and water. After you've cleaned them, place them in clean paper bags and mark the bags to show what's inside. It's easy to get men to wear fresh, clean equipment.

In summary, if you're not certain of your equipment needs, get in touch with someone who is. And above all, please read all package instructions, which are required by law for insecticide manufacturers, and observe the cautions. Finally, "Be thy brother's keeper."

ATTENTION - TERMITE CONTROL OPERATORS

Save $50 to $75 on every termite control job with

RESIDEX DIELDRIN

. . . one of the most economical of all known termite control materials

THE DEVELOPMENT OF DIELDRIN . . .

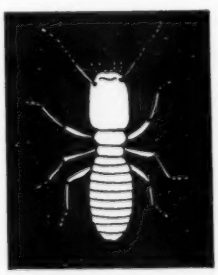
Technical Dieldrin is produced by the Shell Chemical Co. It is a chlorinated hydrocarbon which stops subterranean termites because of long residual action in the soil. Dieldrin is chemically stable in alkaline solids and is not broken down by alkaline plaster waste so often left in the soil when a house is built. In addition, Dieldrin kills termites when they come in contact with treated surfaces or if they feed on treated wood or wood products.

THE REFINEMENT OF DIELDRIN FORMULATIONS

. . . by RESIDEX

Residex Dieldrin is a concentrated emulsifiable form of Dieldrin containing 1.5 lbs. of technical Dieldrin per gallon. One gallon of concentrate makes 60 gallons of ready-to-use soil poison.

Shipped promptly From Stock to Registered Termite Control Operators . . . Write or Phone Collect



TECHNICAL DEPARTMENT

RESIDEX CORPORATION

ADVANTAGES OF RESIDEX DIELDRIN

1. Residex Dieldrin is non-phytotoxic . . . it will not harm plants, shrubs or trees.
2. Residex Dieldrin is economical to use . . . it costs less than 9c per gallon of ready-to-use material. The P.C.O. saves $50 to $75 on each average home termite control job.
3. Residex Dieldrin emulsifies spontaneously and is a stable formulation.
4. Residex Dieldrin is the same price as other formulations but is designed for use by the P.C.O. in and around the home where odor is an important factor . . . THERE IS NO LONG-LASTING ODOR WITH RESIDEX DIELDRIN.
5. Residex Dieldrin also controls other troublesome insects such as cockroaches, silverfish, ants, ticks, wasps in the home . . . and stops lawn and garden pests such as white grubs, wireworms, rootworms, ants, root maggots, white-fringed beetles, chiggers, crickets, chinch bugs, earwigs and sod webworms.

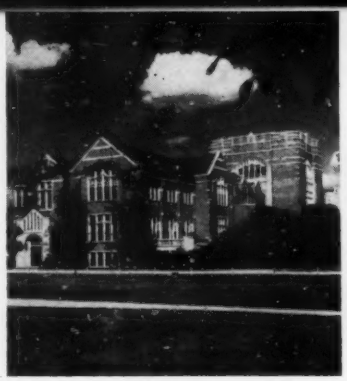
SEND FOR YOUR TECHNICAL BULLETIN DESCRIBING APPLICATION TECHNIQUES FOR USE OF DIELDRIN FOR TERMITE CONTROL

ORDER YOUR SUPPLY OF DIELDRIN TODAY!

1 Gal. Can-4/Case	$5.80 gal.
5 Gal. Can	$5.50 gal.
30 Gal. Drum	$5.20 gal.
55 Gal. Drum	$5.00 gal.

15 gal. or more shipped prepaid

1500 West Elizabeth Avenue **LINDEN, N. J.** **WABASH 5-1320**



Purdue Union Club on the Purdue University Campus houses most of operators who attend the annual Purdue Conference.

Memorial Tower, is familiar landmark to PCOs who visit Louisiana State University campus for Southern PCO Conference.

This beautiful Student Union Building is headquarters for operators who attend the annual Oklahoma A. & M. Conference.

Fennald Hall at University of Massachusetts houses entomology department where sessions at Eastern Conference are held.

1956 Program for PCO Regional Conferences

Each year, PCOs get the opportunity to return to "school" again and learn latest developments and techniques in the pest control field by attending one of the university-sponsored PCO conferences. Four major sessions are already scheduled for 1956 with numerous other conferences and short courses in the planning stage. Here are the complete programs for the first such meetings this year, all of which receive cooperation from the National Pest Control Association. Dates of other meetings will be announced in **Pest Control** just as soon as final schedules are drafted by sponsoring colleges and associations.

6th ANNUAL
Oklahoma A.&M.
and
Oklahoma PCA
PCO CONFERENCE
Oklahoma A.&M. College, Stillwater

Jan. 23-25, 1956

Registration and Fees

Advance registration forms can be obtained from G. A. Bieberdorf, Department of Entomology, Oklahoma A. & M. College, Stillwater. Make registration checks out to Oklahoma Pest Control Association. Registration fee is $10 which includes banquet ticket and attendance at all sessions.

Lodging

Oklahoma A. & M. Union Club, on the University campus, Grand Hotel, Midlam Hotel, and Curran-Au-Tel Hotel, all in downtown Stillwater. Send all requests for hotel reservations to the hotel concerned.

Who May Attend

Termite and pest control operators, public health officials, and others interested in pest control.

Program Emphasis

Business aids for pest control operators.

Program

Monday, Jan. 23: After early morning registration, delegates will be welcomed to this year's conference by College, NPCA and Oklahoma PCA officials. Then, Clyde Bower, Oklahoma State Board of Agriculture, will discuss present and future PCO legislative control. Also on tap for the morning session is a talk on public health as it affects pest control, by the federal co-ordinator of sanitation in Oklahoma City. The afternoon session will be mainly devoted to business problems. Mrs. Phyllis Edmonds, vice president of the Home Federal Savings & Loan Association in Tulsa, will speak on "The Public Can Exterminate Without Chemicals." Then comes a talk on how to sell by Harry Canup, of Oklahoma A. & M. Closing out the afternoon program is a pest control clinic presided over by NPCA executive secretary, Dr. Ralph E. Heal. In the evening, the Oklahoma PCO will hold a business session.

Tuesday, Jan. 24: A picture slide demonstration on termite control in slab construction by R. M. Russell, technical director for Orkin Exterminating Co., Atlanta, opens the morning program. Three other morning talks on termite control are handled by Dr. Ralph E. Heal; Gayle Puryear, Antimite Termite Co., Tulsa; and a representative of the U. S. Department of Agriculture. In the afternoon, the staff of the College's commerce department will take up cost accounting for small businesses. Also on the afternoon agenda is a review of NPCA activities by Dr. Ralph E. Heal. Winding up the program, Tillman Zeigler, Dead Shot Chemical Co., Oklahoma City, covers general pest control in homes. The annual banquet will be held at 6:30 P.M. with Oklahoma PCO Tom Graham acting as toastmaster.

Wednesday, Jan. 25: With Oklahoma A. & M. entomologists C. F. Stiles and Newton Flora at the rostrum, the morning program opens with a discussion of the biology of common pests. Then, Dr. Byron Williamson of Agricultural Specialties, Dallas, Tex., takes up hazards and uses of pest control chemicals. An explanation of weed and grass control in urban areas by Oklahoma A. & M. professor Cliff Elder, ends this year's meeting.

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20th ANNUAL
Purdue
PCO CONFERENCE
Purdue University, Lafayette, Ind.

Jan. 30 - Feb. 3, 1956

Lodging

Purdue Union Club, Fowler Hotel, Lahr Hotel, Morris Bryant Hotel, Cedar Crest Hotel. The Purdue Union Club (now enlarged) is located on the University campus. Fowler and Lahr Hotels are in downtown Lafayette. Cedar Crest Hotel is on Highway 52, approximately 1½ miles northwest of the campus. The Morris Bryant Hotel is about 3 miles northwest of the campus, also on Route 52. Send all requests for reservations directly to the hotels.

Registration and Fees

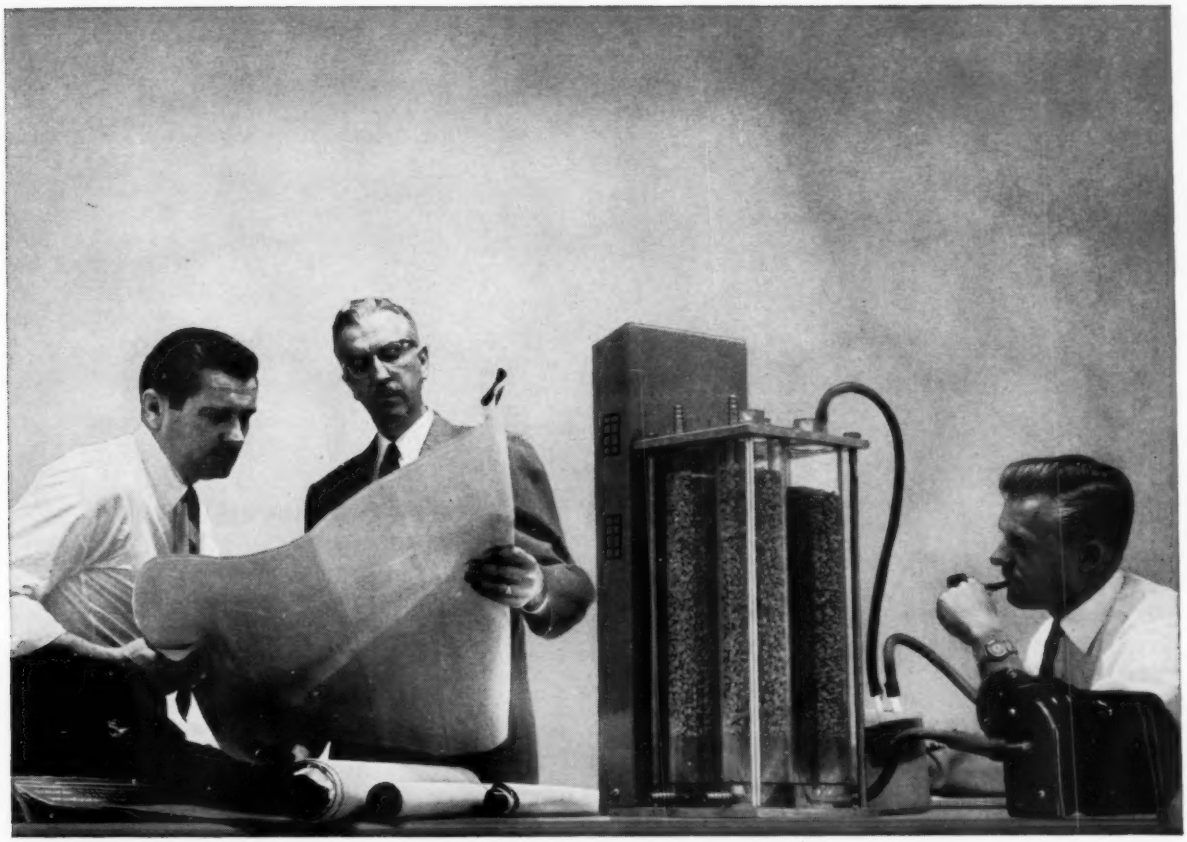
Advance registration forms may be obtained from Professor J. J. Davis, Department of Entomology, Purdue University, or from the National Pest Control Association, 30 Church St., New York 7, N. Y. Cost of registration is $15 and payable by check to Professor Davis. This includes attendance at all sessions, conference manual, banquet ticket and other items.

Who May Attend

Pest control operators, members of affiliated industries, and anyone else interested in pest control.

"Pest of the Year"

Stored grain and food products insects.



Scale model demonstrates how new method eliminates guesswork . . . lowers cost.

FUMIGATING BULK GRAIN?

We can show you how to cut material costs at least 50%

Dow's forced air recirculation process positively controls the distribution of methyl bromide in silo type bins. But—seeing is believing! A scale model demonstration by Dow's engineering service will show you this important new method of fumigating grain in silo type elevators. You will see every detail of the process which sends an even flow of methyl bromide air mixture through the grain mass at a given rate per bushel per minute. Quick . . . uniform . . . sure . . . forced air recirculation eliminates guesswork by making the fumigation of bulk commodities an exact science. And it cuts material costs at least 50 per cent—because controlled distribution of methyl bromide means lower dosages, fast penetration.

Dow has adapted this major fumigation development to both silo type storages and bulk shipments of grain under quarantine in freight cars. (It's effective with peanuts and popcorn, too.) It's ready to help you give your stored commodity accounts maximum fumigation effectiveness. Let a Dow technician show you how it may be adapted to present aerating systems or advise you on the design and installation of recirculation equipment for utilizing methyl bromide. Write our Fumigant Sales Section. THE DOW CHEMICAL COMPANY, Midland, Michigan.

you can depend on DOW FUMIGANTS DOW

good riddance...

with the RAT JIGGER Rodenticide Container

WON'T TIP . . . even if rat steps on edge! Flared skirt fits flush to floor.

WON'T LEAK . . . tests show not a sign of seepage after 18 days! Specifications require 3 days.

STURDY AND SEAMLESS . . . one piece construction shaped under tons of pressure. Holds 3/5 fluid ounce.

BUILT-IN SAFETY . . . warning symbols of skull and cross bones, and "poison" printed all over it.

TESTED AND APPROVED . . . Rat Jiggers meet all specifications of Federal Agencies and National Pest Control Association.

Rat Jiggers set the standard for quality and safety as incorporated in Standard Safe Handling Procedure for Compound 1080 and other liquid poisons.

Packed 5000 to a case.
Prices per M, 5M-25M . . . $5.62 M
Minimum order 4 cases shipped prepaid. Larger quantity prices on request. *T.M. Pat. Pend.

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380 Lexington Avenue, New York 17, N. Y.

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☐ Send samples and full information.

☐ Ship through nearest distributor, 1 case of 5000 No. 1080 RAT JIGGER* Rodenticide Containers @ $5.62 M. Total $28.10, plus freight.

☐ C.O.D. ☐ Check enclosed

Print Name .....

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City ..... Zone ..... State .....

Purdue Conference, from page 18

Program

Sunday, Jan. 29: Registration will be held in the lobby of the Purdue Union Club from 4-6 P.M.

Monday, Jan. 30: As always, both morning and afternoon sessions will be primarily devoted to fundamentals of insect control for benefit of first and second year registrants. Talks and demonstrations at Agricultural Hall will be under the direction of Professors J. J. Davis, B. E. Montgomery, G. E. Lehker, and H. O. Deay. An oldtimers' program is also on tap for Monday and will cover sight recognition of insects and rodent ecology. H. O. Deay and W. D. Fitzwater, of the Fish and Wildlife Service, will handle this meeting. Also scheduled for the afternoon is a tour of the campus.

Tuesday, Jan. 31: The entire day will be devoted to six concurrent sessions on the "Pest of the Year"—stored grain and food products insects Subjects to be covered at these six meetings include: (1) laboratory identification, (2) damage recognition and microanalysis, (3) life history and habits, (4) sources of infestation and preventive measures, (5) clean grain program, and (6) chemical control. Session speakers include: H. O. Deay, J. V. Osmun, G. E. Gould, Lee C. Truman, J. Harvey Sturgeon, Lee Patrick, O. H. Hammer, George Daughters, and G. E. Lehker. A Tuesday evening meeting on the use of Kodachrome pictures in the development of public relations is also planned. Dr. Philip J. Spear, NPCA technical director, will be in charge of this session.

Wednesday, Feb. 1: The morning meeting will consist of four rotating sessions covering bird control techniques such as rope fuse, glue, distress cries, and mechanical problems with equipment; and rodent control including status of anticoagulants and bait preparation and placement. Directing these sessions will be Art Gibson, W. D. Fitzwater, A. W. Burr, Robert Fletcher, W. K. Delaplane, Jr., G. C. Oderkirk, Harlan Shuyler, and E. F. Sennewald. The afternoon program will consist of equipment demonstrations in the Judging Pavilion by manufacturers and suppliers of pest control products. Suppliers of pest control equipment and chemicals are invited to exhibit their products during the conference at no additional charge over the regular registration fee. In the evening there will be a general round table discussion with questions from the floor addressed to the officers of the NPCA and others. J. Harvey Sturgeon will also speak on the purpose and value of an organization.

Thursday, Feb. 2: The morning session will feature three talks on termite control. Professor John V. Osmun leads off with an address on life history, habits and habitats of subterranean termites. Then, Washington, D. C. PCO, A. H. Bender, speaks on "Where Are We Going in Control Practices Against Subterranean Termites?" In the afternoon there will be a discussion of pricing termite jobs and dealing with the fraudulent operator, by Cincinnati, Ohio PCO, Robert C. Yeager. Other sessions on wood-destroying insects are planned. The annual banquet will be held in the Union Club Thursday evening at 6:30. Dean F. C. Hockema, of Purdue, will be toastmaster, and Dr. Kenneth McFarland, of General Motors Corp., will be guest speaker.

Friday, Feb. 3: In the morning, there will be a demonstration on the use of dusts and baits in pest control, and a talk on insect resistance by E. F. Knipling. The conference concludes with the morning program.

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16th ANNUAL

Southern

PCO CONFERENCE

Louisiana State University
Baton Rouge, Louisiana

Jan. 30 - Feb. 1, 1956

Lodging

Pleasant Hall on the University campus; Heidelberg Hotel, King Hotel, Istrouma Hotel, all in Baton Rouge. There are also several new motels near the city. For reservations in Pleasant Hall or local hotels write directly to Pleasant Hall or the hotel concerned.

Registration and Fees

Registration fee is $15. This includes conference manual, banquet ticket, and privilege of attendance at all meetings. Send requests for advance registration forms to Dr. O. W. Rosewall, Department of Zoology and Entomology, Louisiana State University, Baton Rouge 3, La. Make advance registration checks payable to L. S. Bridges and send to Dr. Rosewall.

Who May Attend

Anyone interested in pest control who pays registration fee.

Topic of the Year

Legislation.

Program:

Monday, Jan. 30: Registration ends at 9:30 A.M. Dr. Ralph E. Heal, NPCA executive secretary, will kick off the meeting with a talk on how to use the NPCA Serviceman's Manual. I. B. Carncross, NPCA president, will describe the role of the PCO in disaster areas. Dr. Heal again takes over the microphone to close out the morning session with an address on new chemicals and equipment.

In the afternoon, a certified public accountant will be on hand to explain business costs followed by a talk on advertising costs and values. A showing of the Sinclair Refining Co. film "500,000 to 1" will end the afternoon program. At 7:30 P.M. there will be a panel discussion on state PCO legislation.

Tuesday, Jan. 31: The morning program opens with a discussion of NPCA color insect slides by Dr. Heal and rodent control and grain sanitation by John C. Jones, of the U. S. Fish and Wildlife Service, Washington, D.C. After an address on rodent

Why compromise with certainty, with safety?
In manufacturing insecticides . . .

Be Certain - Be Safe with African Pyrethrum

Nature's Own Insecticide Base That Alone Is

Toxic to All Insects . . .

Harmless to Human and to Animal Life

PYRETHRUM alone assures:

- Unsurpassed quick knock-down
- Economy in lower concentrations with synergists
- Rapid dispersal
- High penetration

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With PYRETHRUM you can guarantee protection of the highest order for:

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- Flour Mills and Granaries
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- Ship's Holds
- Poultry Houses
- Chocolate Manufacturers
- Feed Stuff Plants
- Packing Houses

THERE IS NO SUBSTITUTE FOR

African Pyrethrum

Only the best base assures the best finished insecticide

signs by R. E. Couhig, of Orkin, the University entomological staff covers household insect biology and control. In the afternoon Orkin's technical director, R. M. Russell, discusses industrial fumigation by use of enclosures. Then there will be a panel discussion on resistance from the research point of view. Texas PCOs Lonnie Holder and W. I. Elo will take up roach resistance. At 7:30 P.M. the annual banquet will be held at the Heidelberg Hotel with PCO Paul K. Adams, of Alexandria, La., serving as toastmaster.

Wednesday, Feb. 1: The conference comes to a close after the morning session which will be entirely devoted to termite control. Subjects lined up for this program include control recommendations, real estate policies and a panel discussion of current problems.

•

16th ANNUAL

Eastern

PCO CONFERENCE

University of Massachusetts, Amherst

February 2-4, 1956

Lodging

The Lord Jeffery Inn and Mount Pleasant Inn, both in Amherst, and the Hotel Northampton, in Northampton. Rooms are also available in one of the University's new dormitories. Make reservations direct with hotels. For rooms in dormitories, write direct to Housing Officer Frank B. Thomas, at the University.

Registration and Fees

Advance registration forms can be obtained from the National Pest Control Association, 30 Church St., New York 7, N. Y., or Frank E. Bohman, Conference Treasurer, Box 65, Hartford 1, Conn. Registration fee is $17.50 and includes conference manual, banquet, attendance at all sessions, and incidental items. Make checks for advance registration payable to Mr. Bohman.

Who May Attend

All professional pest control operators and others who are interested in pest control and allied subjects.

Program

Thursday, Feb. 2: After morning registration, the program officially opens with talks on: latest developments in the pest control industry; lawn, turf and garden pests, and lawn diseases. Speakers include Dr. Philip J. Spear, NPCA technical director; Professor L. S. Dickinson, of the University; Dr. Spencer H. Davis of Rutgers University, New Brunswick, N. J.; and Dr. Theodore Kerr. After a panel discussion on rodent control chaired by Howard Merrill, U. S. Fish and Wildlife Service District Agent, Boston Mass., afternoon sessions will be exclusively devoted to problems presented by flood emergencies and will cover such topics as mosquitoes, disease and decontamination, rodent problems, government organization in disaster relief, and the place of the PCO in such problems. On hand to lead these sessions will be Dr. Spear, Mr. Merrill, and representatives of the U. S. Public Health Service and mosquito control projects.

Friday, Feb. 3: Morning session will feature a laboratory session headed by Dr. C. P. Alexander, of the University, on pests encountered by sanitary inspectors. In the afternoon there will be a forum on sanitary problems including talks on proper inspection methods and how the pest control industry fits into the picture. Speakers will be Max Garber, of the Massachusetts Department of Public Health, and George Hockenyos, Sentinel Laboratory, Springfield, Ill. The annual banquet will be held Friday evening with PCO David P. McAlindin serving as toastmaster.

Saturday, Feb. 4: Kicking off the last day's program, Dr. John Pratt, of the Army Quartermaster Corps, will explain the nature of resistance in insects. Addresses by Dr. H. L. Sweetman, of the University of Massachusetts, Dr. Theodore Kerr, and Dr. Philip J. Spear, on some problems that arise in new construction, close out the conference.

WITHOUT CARCASS NUISANCE

USE PROVEN Larvacide.

CHLOR PICRIN

KILLS Drives rodents out to die in the open. No waiting. No carcass nuisance as with baits.

Warehouse treatment costs as little as 25c per 1,000 cubic feet.

Burrows — Mere traces of LARVACIDE prevent rehabitation until burrows fall in from lack of use.

REPELS

In Warehouses — Use LARVACIDE wick bottle in runways. Keeps rats away. Doesn't bother humans.

Melvin Laboratories, Memphis, Tenn., writes:
"During December when rats drive indoors for food, by placing 12 bottles at strategic points in warehouse of 4,000 square feet, the building was kept practically free of rodent entry . . at a cost of approximately $12.

Carry the handy 12 bottle carton in your car for sudden needs. Write for detailed information.

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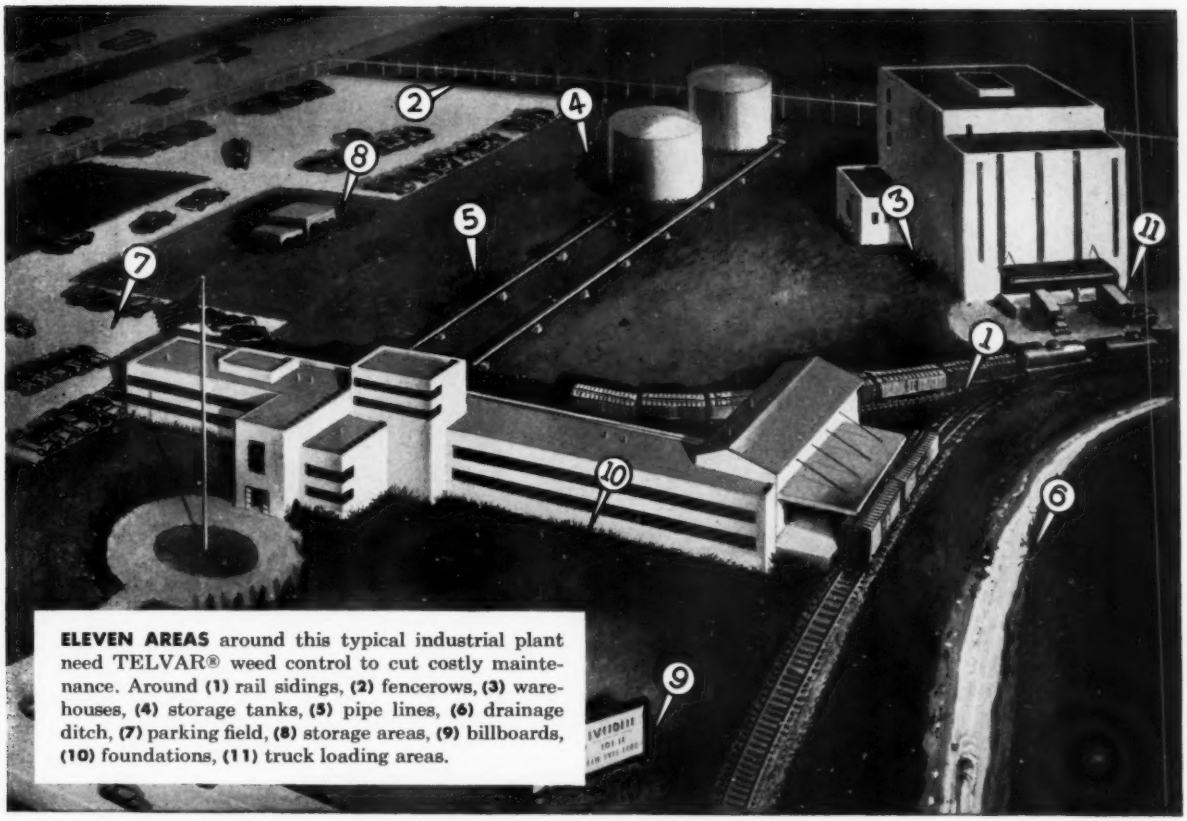
Here's where to find new profits right now . . .



ELEVEN AREAS around this typical industrial plant need TELVAR® weed control to cut costly maintenance. Around **(1)** rail sidings, **(2)** fencerows, **(3)** warehouses, **(4)** storage tanks, **(5)** pipe lines, **(6)** drainage ditch, **(7)** parking field, **(8)** storage areas, **(9)** billboards, **(10)** foundations, **(11)** truck loading areas.

Solve this year's weed problems early with new formulation of Du Pont Telvar®

WEED KILLER

With new Du Pont "Telvar" DW, you can start your weed-control services right now. Treating industrial areas now with one application of "Telvar" DW to solve next summer's weed problems can mean new business for you and better use of your manpower and equipment.

Just think of all the places at plants you may now be serving where weeds and grass are an eyesore, a fire hazard or a plain nuisance: storage areas, stock piles, pole yards, rail sidings, foundations, storage tanks, parking lots, signposts, fences and many others. These areas represent a profitable market for your services.

As little as 1 or 2 pounds of "Telvar" per 1,000 square feet (40 to 80 pounds per acre) kills vegetation and prevents regrowth for a growing season or longer. All you do is mix it with water and apply with your regular spray equipment. It is non-flammable, non-volatile, and non-corrosive to equipment.

Du Pont is telling industry about "Telvar" and suggesting the services of custom sprayers to apply it through advertisements in industrial and business publications. For free illustrated booklet showing results with "Telvar" write Du Pont, Grasselli Chemicals Dept., Room D-4032, Wilmington, Del.

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WEED KILLERS

On all chemicals always follow directions for application. Where warning or caution statements on use of the product are given, read them carefully.

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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

In Day-to-Day PCO Work There's Always the Danger of

FIRE!

Are You Aware of Hazards and Precautions?

UNDER certain conditions there is a very definite fire hazard involved in some forms of pest and termite control.

Fires have resulted from the use of several termite exterminating materials. Some years ago a very forceful explosion occurred in a midwestern city as a result of a building fumigation. In this particular instance, termites had attacked the building above an unexcavated portion. The PCO's method of treatment consisted of spraying all exposed wood and ground in the vicinity. Unexcavated portion of this structure was not well ventilated and after the work was completed the air was apparently filled with vapor and mist from the spraying process. Of course, this condition is very conducive and favorable to an explosion when the flammable liquid is in suspension.

The men had come out from under the building and were withdrawing the hose and electric light extension cord through a small opening in the foundation when the explosion occurred. It resulted in no material damage to the building itself, however the flames shot through an opening and ignited the clothing of the young son of the building owner and one of the workmen who were standing directly in the path of the flames. Unfortunately, both died as a result of their burns.

This operator's equipment consisted of a gasoline engine and a compressor mounted on a truck which was parked in the street. A hose from the compressor was attached to a sealed 50 gallon drum and another hose from the drum terminated in a spray nozzle. It is believed that the cause of the explosion was probably a broken electric light bulb, a short circuit in the wiring, or possibly a static spark created by friction in the hose attached to the spray nozzle.

According to the U. S. Department of Agriculture and other authorities, the application of toxic insecticides to the interior of infested wood is of only partial value and the use of fumigants, if flammable, introduces a severe fire hazard. If used, precautions required are thorough ventilation in order to prevent the formation of combustible mixtures of air and vapor; elimination of sources of ignition such as open flames, pilot lights, ordinary incandescent electric lights or any other arcing or sparkling electrical equipment; and the avoidance of operations which might result in sparks. All liquids used for this purpose should have their hazard definitely determined and indicated through examination and listing by Underwriters Laboratories.

• Fogging Hazards

Numerous explosions and fires originating in thermal insecticidal fogging operations have been reported. This type of operation is an outgrowth of World War II in which smoke screen techniques were used to combat malarial mosquito outbreaks. The heat, pressure and turbulence transform the spray into a billowy aerosol which is then blown into the area to be treated. Aerosols are extremely fine suspensions of solid or liquid particles in air or gas, such as smoke, fog or mist. For effective dispersion the particles must approximate in size those of fog. It must be remembered that any flammable liquid in this mist form is ideally suited for an explosion.

Since flammable liquids are often used in thermal fogging, certain safety factors must be considered, particularly when the process is being used for indoor operations. Details such as the flash point of the carrier must be taken into consideration together with any possible source of ignition. Most accidents have occurred because pilot lights were not extinguished or electrical switches were left connected to their power source.

In one case, an operator attempted to use a home-made formula in which he substituted naphtha in place of a high-flashpoint liquid. Remember, the lower the flashpoint, the more dangerous the liquid!

A number of liquids will flash at room temperature, namely gasoline, benzene or naphtha. Gasoline will still vaporize at 40 degrees below zero. We have had instances in which gas station operators will put a little gasoline into a poor grade of fuel oil and then sell it as No. 1 fuel oil. It doesn't work out that way. The small amount of gasoline that was put into that fuel oil renders it unfit and dangerous to use as fuel oil.

• 15 Safety Precautions

Here are a few things to remember in this type of operation.

1. Evacuate all personnel except essential operators from the building.

2. Only experienced, responsible personnel who are thoroughly familiar with operation instructions and attendant fire safeguards should be permitted to operate the fogging unit.

3. The local fire marshal or fire chief should be informed of the fogging operations with full details as to location, time, and materials to be used.

4. Use of approved equipment only is recommended. No oil carrier should ever be employed that has a flash point lower than that of kerosene. (120 deg.) (Michigan Kerosene Inspection Law). As a maximum, allow one gallon of insecticide for 50,000 cubic feet for indoor fogging. One gallon of kerosene will render 2,000 cu. ft. of air explosive (Room, 15′ x 17′ x 8′). One gallon in 50,000 cu. ft. yields a concentration that is well below the lower explosive limit. An average 8 room house is approxi-

by
SGT. THOMAS TOBIN
Fire Marshall Division
Michigan State Police
East Lansing

DANGER!

Pictured is one of the plagues of Athens in which rats played a major part! History records other famous plagues and always rodents are in the pattern.

Complete, Effective Rodent Control with

DETHMOR

WARFARIN

It was not until modern science developed DETHMOR WARFARIN that the complete *elimination* of these pests became *certain* and *easy*. Only DETHMOR assures the *customer* of *certain control.*

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mately 25,000 cu. ft. Generating machinery should be operated outside the building.

5. In exterior operations involving areas beneath buildings, the same safety precautions as required for interior fogging should apply. Accidental entry of heavy concentrates into open basement windows must not be overlooked.

6. Doors may be blocked open where this will assist ventilation and fog dispersion however it is important that doors in fire walls and fire partitions and doors at elevators, stairways and other vertical openings be kept securely closed.

7. All fires, open flames and similar sources of ignition should be eliminated from the space being fogged. Shut off the main gas control valve and determine by visual inspection that all pilot lights, fires and any other open flames have been extinguished. Gas service should be restored only by an authorized gas company representative.

8. All electric power to the building should be disconnected by opening the main control switch. Also see that telephones are disconnected unless nonflammable fluid formulas are used.

9. The fog should not be blasted directly against any combustible object or material. A distance of at least 10 feet should be maintained.

10. Inasmuch as the hose is hot when in use, it should be wrapped with asbestos or insulated with asbestos material.

11. Operations should be stopped as soon as the building is filled with the prescribed quantity of fog.

12. The temperature gauge should be read and calibrated at frequent intervals and if the temperature rises above normal, the equipment should be shut down immediately for adjustment. Excessive temperatures may cause "cracking" of the insecticide fluid into highly flammable gases and vapors.

13. After completion, buildings should be thoroughly ventilated and as an added precaution special fire safety care should be exercised for at least 24 hours.

14. Disorderly procedure and unsightly appearances are an invitation to trouble. Flammable liquids should be kept only in approved containers and any spillage should be immediately mopped up and discarded in a safe manner.

15. All equipment should be maintained in the cleanest possible condition and should be regularly inspected.

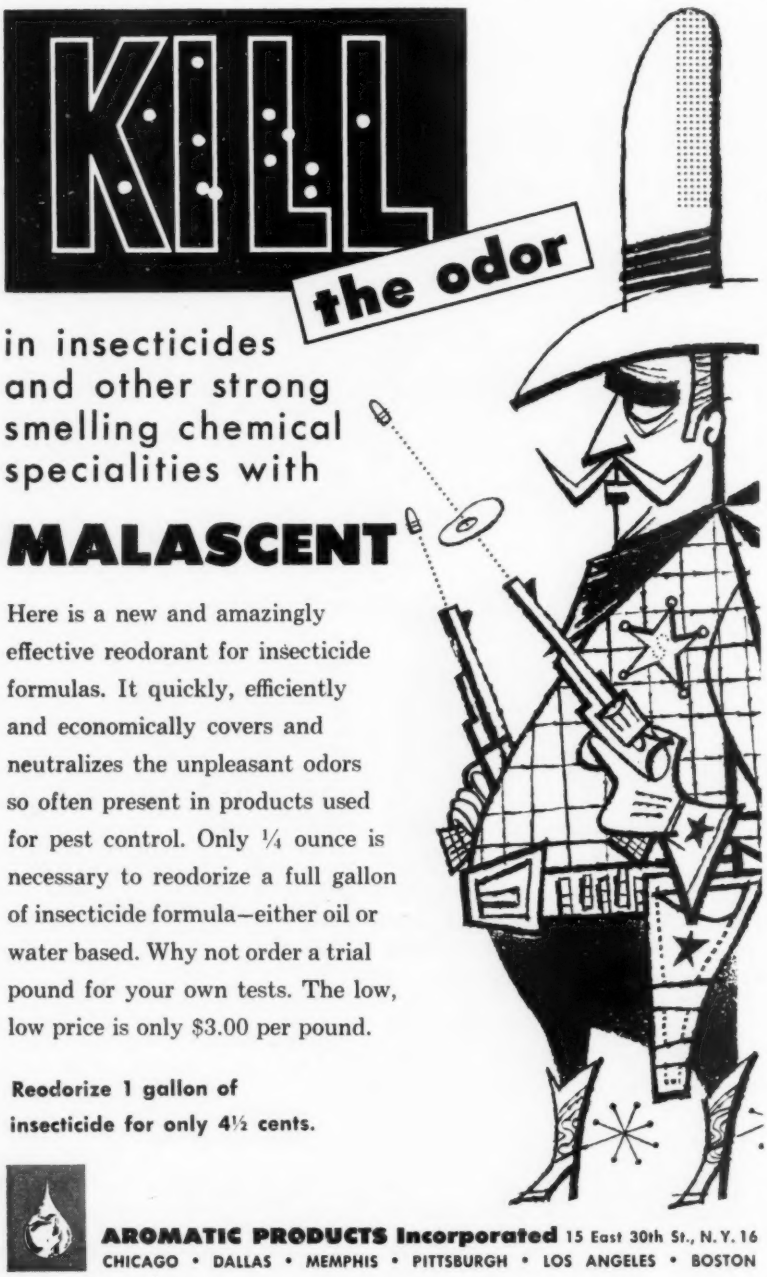
Just a word about sulphur candles. Remember that you have an open flame and care should be taken in the location of such an object. Information received at the Michigan State Health Laboratory reveals that the fire hazard is not too great, however the odor is objectionable.

There is one fumigant that does not involve a fire hazard and that is carbon tetrachloride. Fire inspectors come in contact with this substance because it is used greatly as a fire extinguishing agent. We find them in old homes and always order them out, not that they aren't a good extinguisher but because they should not be used where there is little or no ventilation. Carbon tetrachloride is toxic and has caused numerous deaths and should be used carefully.

The health angle is not the only problem involved in pest control and fumigation. Danger of fire is ever present when a flammable solvent is used and care should always be taken to avoid any ignition.

Headlee Fund Tops $44,000

Rutgers University's Thomas J. Headlee Fellowship in Entomology now has a principal fund of more than $44,000. Two projects currently being conducted under the fund are a study of the occurrence of hyaluronidase in insects, and an investigation of why insects become resistant.



in insecticides and other strong smelling chemical specialities with

MALASCENT

Here is a new and amazingly effective reodorant for insecticide formulas. It quickly, efficiently and economically covers and neutralizes the unpleasant odors so often present in products used for pest control. Only ¼ ounce is necessary to reodorize a full gallon of insecticide formula—either oil or water based. Why not order a trial pound for your own tests. The low, low price is only $3.00 per pound.

Reodorize 1 gallon of insecticide for only 4½ cents.

AROMATIC PRODUCTS Incorporated 15 East 30th St., N. Y. 16
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Infestation Report

Contains pertinent portions of the Department of Agriculture's **Cooperative Economic Insect Report**, material from university entomology departments, and reports from readers. PCOs noticing infestations in their own areas are urged to communicate with **Pest Control** so their information may be added to this infestation report.

A BOT FLY
(Cuterebra horripilum)

Florida: Adult collected at residence in Sebring, Highlands County. Parasite or rodents; adults seldom encountered.

A HORSE FLY
(Tabanus calens)

South Carolina: Taken for the first time at Columbia.

A KATYDID
(Neoconocephalus triops)

Mississippi: Large numbers in business section of Jackson, where they were attracted to lights.

A MITE
(Histiogaster carpio)

Oregon: In tapioca starch at a paper mill in Oregon City recently.

ANTS

Virginia: Winged forms recently emerged in Richmond and caused concern to home owners.

A VINEGAR GNAT
(Drosophila hydei)

North Carolina: In several homes and a heavy infestation around new farmers' market hindering packaging in Wake County.

BLACK WIDOW SPIDER
(Latrodectus mactans)

Virginia: Fewer calls than usual received by state entomologist during 1955. However, numerous requests for information received from southeastern part of state. Some control recommendations still being requested from northern and eastern areas. **Maryland:** Several calls received recently from home owners in the Hagerstown area. **Nevada:** Numerous inquiries being received. **Ohio:** Recently abundant in a new housing development near Waverly and in a number of cottages at Buckeye Lake resort.

BOXELDER BUG
(Leptocoris trivittatus)

Virginia: Invading homes and collecting in large numbers on trees and buildings in Nelson and York counties and in city of Hampton. **Maryland:** Swarming on old house at Ashton, Montgomery County. **North Carolina:** Causing concern at a home in Rowan County. **Kansas:** Heavy populations reported from most areas of state recently. **Ohio:** Have recently been annoying householders in many areas.

BROWN-BANDED ROACH
(Supella supellectilium)

Nevada: Infestation in home in Reno. First report of this cockroach in Nevada.

BROWN DOG TICK
(Rhipicephalus sanguineus)

North Carolina: Heavy infestation in a home in Wake County. **Arizona:** Continues as a problem in Tucson area. Populations were abnormally heavy during 1955. **Texas:** Unusually heavy on dogs in the College Station area. **Maryland:** Engorged immature stages found in home in Prince Georges County.

CARPET BEETLES

Maryland: Causing damage in homes in Montgomery and Harford counties.

CIGARETTE BEETLE
(Lasioderma serricorne)

Maryland: Recently infesting spices in Catonsville, Baltimore County.

CLOVER MITE
(Bryobia praetiosa)

Nevada: Fall migration into homes caused numerous inquiries. **North Dakota:** Invading dwellings in many scattered points over state. Appeared somewhat later than usual in 1955.

CLUSTER FLY
(Pollendia rudis)

Virginia: Annoying in house in Blacksburg.

COCKROACHES

Texas: Medium to heavy infestation in many homes in Menard County. Apparently resistant to chlordane. **Virginia:** Heavy infestation in a home in Loudoun County.

DARK MEALWORM
(Tenebrio obscurus)

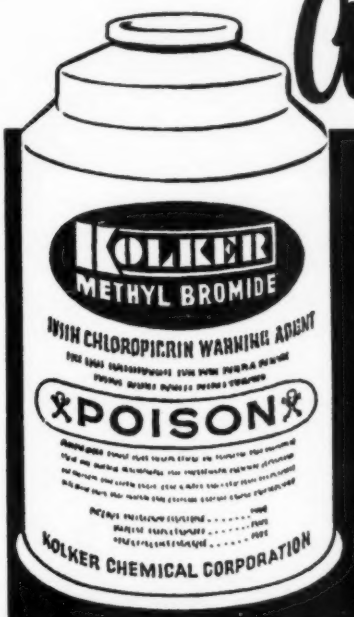
Ohio: Larvae entering homes in Circleville where infested manure was placed in yards.

GIANT HORNET
(Vespa crabro germana)

Virginia: Becoming more troublesome each year. Recently nesting under eaves, siding and in woods in

(Continued on page 47)

Announcing



KOLKER METHYL BROMIDE

Now being produced at our modern plant in Newark, N.J., Kolker Methyl Bromide is the outstanding fumigant for the elimination of insect and rodent infestation of grain, tobacco plant beds, seeds, dried fruits, cereals, nursery stock and a wide variety of other products.

KOLKER METHYL BROMIDE

- Kills insects, mites and related pests in all stages of their development.
- Has a high degree of toxicity to a wide range of insects, rodents and other pests.
- Has rapid volatilization and a high rate of diffusion into stored grain, bales, packages and soil.
- Is non-explosive and non-flammable.
- Does not leave any residual odors, tastes or stains.
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Kolker Methyl Bromide is packaged in regular one-pound cans with 2% chloropicrin as warning agent, and 125, 150 and 450 pound cylinders of 100% methyl bromide.

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For further information on this highly effective fumigant, please call or write us today.

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Toxicity Concern, Miller Bill, Food Protection Rejuvenate Use of Pyrethrum-type Insecticides

Kenya and Belgian Congo Supplies Adequate in Foreseeable Future CSMA New York Meeting Told

Pyrethrum, once the most widely used insecticide, by 1946 had been virtually written off as a less desirable pest control chemical when applicators switched to the longer-lasting chlorinated hydrocarbons such as DDT, chlordane, etc. But the trend is being reversed, John Rodda of Fairfield Chemical Division, Food Machinery Corporation, Baltimore, told delegates to the insecticide division meeting held during the Chemical Specialties Manufacturers Association 42nd annual convention in New York's Hotel Roosevelt last month.

By 1950, consumption of pyrethrum once again exceeded available supplies, but by combining it with synergists which do not change pyrethrum's low mammalian toxicity, benefits of the flower-derived insecticide could be extended. Resultant products are as safe to use as pyrethrum itself.

Mr. Rodda said U. S. usage of pyrethrum insecticides now ranges between 85,000 and 100,000 pounds annually, but predicted increasing influence of the Miller Bill's efforts to minimize pesticide residues on food would increase pyrethrum consumption. Today the major source of supply is from the Kenya Colony in Africa and the Belgian Congo. Other sources in South America and Japan are said to be insignificant.

In spite of the increased use of pyrethrum once again, users can not look for any price reduction within the next several years, Mr. Rodda said. Weakening of price structure would eliminate marginal flower growers thus reducing supply.

Pyrethrum's low mammalian toxicity, fast knockdown, and wide range of pesticide use were the reasons for its original universal acceptance as a popular insecticide for structural pest control. These same qualities explain the current rejuvinated interest in pyrethrum.

Asked their opinion of the new USDA-developed pyrethrum synergist sesmolin, suppliers did not predict any quick availability because of the expensive extraction process required.

Dr. E. G. Klarmann, (right) new CSMA president, accepts congratulations from his predecessor **Melvin Fuld,** of Baltimore Maryland.

● Deodorant-Insecticide Aerosols

Leo Trademan of Velsicol Chemical Corporation, Chicago, reported the results of recent work which indicates residual sprays from low pressure aerosols of chlordane and quaternary ammonium compounds give good control of both insects and odors. These combined problems often exist in such places as basements, garbage containers, and in outhouses.

An aerosol of this type, he said, is composed of the following: insecticide and knockdown agent, solvent, co-solvent, and finally, propellant. Trademan said that since the majority of quaternaries are not entirely soluble in solvents used for chlordane, a co-solvent is necessary. The one found to be most successful was isopropro-alcohol.

Velsicol also studied formulation stability, low temperature compatibility, proper valves for spraying, and container corrosion. Finally, performance tests were conducted by spraying in and around garbage cans, basements, privies, etc. In every case, Trademan said, good insect and odor control were obtained.

● Livestock Insect Control Research

Much more needs to be done in the control of livestock insects, according to A. W. Lindquist, of the Entomology Research Branch, Agricultural Research Service, U. S. Department of Agriculture.

The federal government spends 8 to 10 times as much money controlling plant pests as it devotes to livestock pests in spite of the fact that plant values run only 12 to 14 billion dollars a year while annual livestock values amount to 18 to 20 billions.

In addition, 10 times as many research men are devoting study to plant pests as are working on livestock pest control. There are probably fewer than 30 men working on the huge livestock industry, Mr. Lindquist reported in his plea for attention to pest control problems in this phase of America's food production.

During the two-day meeting attended by better than 850, there was on display an exhibit of 40 oil paintings and watercolors by Michael Lemmermeyer, president of Aromatic Products, Inc. of New York. Active in CSMA activities, many of the portraits shown by Mr. Lemmermeyer were of persons responsible for progress in the pesticide field.

● Klarmann Becomes President

Dr. Emil G. Klarmann, vice president of Lehn & Fink Products Corp., New York City, was elected president of CSMA succeeding Melvin Fuld, president of Fuld Brothers, Inc., Baltimore.

Other officers picked by the 42-year old trade group are: 1st vice-president, Harry E. Peterson, Peterson Filling & Packaging Corp., Danville, Ill.; 2nd vice-president, James E. Ferris, Niagara Alkali Co., New York. P. C. Reilly, Reilly Tar & Chemical Corp., Indianapolis, and H. W. Hamilton, Montclair, N. J., were reelected treasurer and secretary, respectively.

Heading the insecticide division's activities are Carlos Kampmeier, Rohm & Haas Co., Philahelphia as chairman, and John Rodda, Fairfield Chemical Division, FMC, as vice-chairman. Three members at large are: retiring chairman George W. Fiero, Esso Standard Oil Co., New York, Joseph Lee, McLaughlin Gormley King Co., Minneapolis, and Thomas Metzger, Continental Can Co., New York.

Next meeting of the CSMA will be held at the Drake Hotel in Chicago, May 20-22.

A. F. C. QUALITY PRODUCTS FOR PEST CONTROL

Chlordane, oil concentrate, liquid emulsifiable concentrate, wettable powder concentrate, and ready-to-use liquids and powders.

Super Fluorex V, powerful insecticide powder
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Phosphorous Paste
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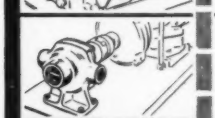
years of trouble-free service — Use on farm crop spraying equipment has proved HYPRO durability. Now you can get the same low-cost reliability in this complete line of HYPRO Pumps, specially designed for spraying and liquid transfer.

HYPRO MODEL N4000
(shown with engine) for high pressure spraying in smaller areas



HYPRO MODEL N6000
(shown with engine) medium capacity, for most spraying applications.

HYPRO MODEL N638
(shown with motor) a low-capacity pump for spraying or liquid transfer.

facts about HYPRO pumps

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Climatic and Structural Conditions that Favor Attack by

Wood Destroying Fungi

by

PROFESSOR LEWIS F. ROTH

Oregon State College, Corvallis, Ore.

The "cleansing of the leprosy in the house" reported in The Book of Leviticus 14 indicates that dry rot in buildings has long been a matter of concern. Decay in wooden structures has been a chronic ailment across the years, and has, at times, even threatened the national security of maritime nations.

An interesting occurrence in ships is reported in 1690[1], where "examination of 30 newly launched ships showed that they were found to be in such bad shape as to be in danger of sinking at their moorings. The ships were so deeply infected with the evil that they were (even in their thick stuff) become so rotten as to be reduced to powder." One Mr. Pepys is reported to have "gathered toadstools from out of their holds as big as his fists."

On the other hand the survival of several seventeenth century buildings scattered through New England as well as many equally old or older structures found in the wet maritime climate of Britain and elsewhere, show that wooden buildings, when well constructed and maintained, are very durable. Of course, the service expectancy is not long for a building with its timbers on the ground, with inadequate sub-floor ventilation and so poorly constructed as to be subject to leaks. Well-constructed buildings, however, deteriorate only after they have become obsolete and are no longer maintained.

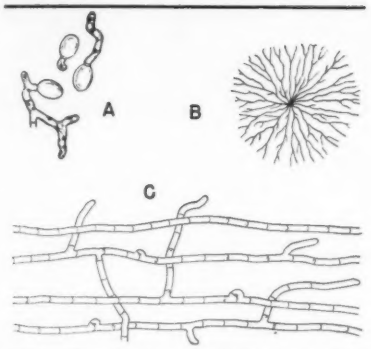

Figure 1. Growth characteristics of wood destroying fungi: **A.** Germinating spores. **B.** Young mycelium of which individual strands are termed hyphae. **C.** Highly magnified portion of mycelium showing cellular detail and structure of the hyphae.

Figure 2. Mycelial fan of the "dry-rot" fungus. This is a thin sheet of mycelium made up of thousands of radiating hyphae. Note advancing margin of fungus (top) and decomposition of plywood panel following fungus action which is shown at bottom.

Decay in buildings is enabled by three factors: (1) presence of wood decaying fungi, (2) a readily available source of food for their use, and (3) an adequate supply of moisture. While many kinds of fungi can decay wood, the number capable of attacking wood in service is relatively small, and only a few decay buildings.[2]

The great fertility of these fungi results in their presence everywhere. Food supply for fungi is lignin, cellulose, and related materials in the walls of wood cells. The third factor, adequate supply of moisture, may arise from a variety of sources, including condensation and leaks of various kinds.

● Cause of Wood Decay

Fungi are the only organisms known to cause primary decay of wood. These atypical plants, unlike the higher plants, lack chlorophyll that would enable them to manufacture their own food. This inability to manufacture food forces them to live on the woody remains of their green relatives, and to obtain their food by secretion of a variety of wood digesting enzymes.

The fungus body (Figure 1) is made up of microscopic branching thread-like strands called hyphae. Growth and repeated branching build up a mass of cottony filaments large enough to be easily seen. This mass, the mycelium, is the conspicuous white mold, the evidence of decay, one sees on the surface of timbers under a moist building where decay is in progress. The advantage for the fungus of this system of endlessly branching hyphae is the great amount of surface exposed for the excretion of enzymes and the ready absorption of food materials available following enzyme action.

The fungus body is not highly specialized, but two distinctive vegetative structures are commonly seen by the pest control operator: the mycelial fan (Figure 2) which is associated with rapid advancement of the fungus and the rhizomorph (Figures 3&4) which often serves as a water conducting structure connecting the mycelial fan with the soil or with wet, decaying wood. Both structures consist of white, compacted mycelial strands, the former flattened and radiating in a fan-like manner, the latter

A talk presented at a conference of the Pacific Northwest Pest Control Operators at Corvallis, Oregon, February 28, 1955.

1. John Knowles. 1921. An inquiry into the means which have been taken to preserve the British navy from dry rot.

2. The principal fungi concerned in buildings are: **Poria incrassata** B. & C., **Trametes** Fr. **(Porta monticola)** and **Merulius lacrymans** (Wulf.) Fr. Six or seven others occasionally are found.

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Figure 3. Rhizomorph of a wood rot fungus on the face of a decayed timber. Structures are made up of tightly pressed hyphae and serve for conduction to and from mycelium.

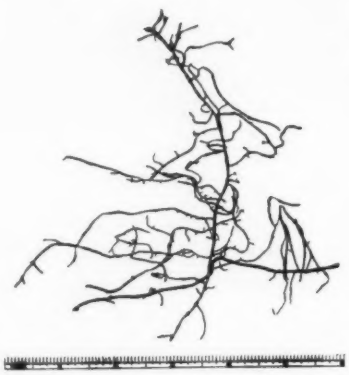

Figure 4. Rhizomorph of this decay fungus was found under the bark of a tree.

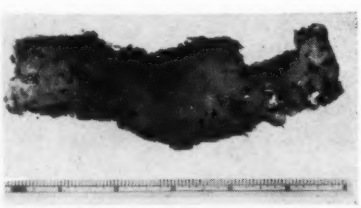

Figure 5. Conk (fruiting body) of a wood rot fungus. This type is frequently associated with decay in buildings or other wooden structures. Countless spores which spread the fungus are found in the minute pores.

Figure 6. Conk of a timber decay fungus on bark of living tree. Note pores (lower surface) in which countless spores are found. Spores infect other trees and wood.

pressed into a branching rope-like structure.

Most wood-destroying fungi bear tiny spores that serve like seeds to spread them. The spores are borne on four minute spicules protruding from the inflated tip cells of the reproductive hyphae. These cells are not distributed at random over the surface of the mycelium, but are gathered together as a layer of parallel spore-bearing cells into special fruiting structures. These structures may be simple, wide spreading sheets of fungus tissue, as are most often seen in decaying buildings, or thick massive structures called conks (Figures 5&6). Such fruiting bodies provide a means of detecting decay where it may not otherwise be evident. Frequently fruit bodies form at humidities too low to allow surface growth of fungi. It is noteworthy that spores are formed in great numbers. A.H.R. Buller reports the formation of thirty billion spores by one fruit body in a single day.

● How Fungi Enter Wooden Structures

This wide distribution of uncountable billions of spores would make one expect all wood to become quickly decayed. This is not the case, because several factors limit the ability of the spores to start infections. Many are short lived. Most fall on surfaces other than wood, where they die. Frequently, temperature which is critical for their germination, is unfavorable. Often, even though they germinate on the right kind of wood, the fungi compete with molds and other organisms and are destroyed. Most often moisture is inadequate for growth. This last item is a primary limiting factor, when the spores alight on wood liable to decay by their particular kind.

When development is not restricted by one of the above factors, the spores germinate as would a seed. A slender hypha emerges which secretes enzymes. Enzymatic activity returns a supply of food to the hypha which enables its growth and penetration into the wood. Infection by spores, however, is probably less common than infection by hyphae from the soil.

Fungi probably enter structures directly from the soil more often than by any other means. The earth is truly a mother to decay fungi, because soil conditions are regularly favorable for spore germination and survival. Competition from other organisms appears to be the primary limiting factor in the soil, but in spite of this competition, most soils harbor a variety of wood decay fungi capable of damaging structures which come in contact with the soil.

A third method of entry by fungi is through lumber already infected at the time of construction. It is notable that many wood-destroying fungi attack the heartwood of living trees. These infections, which in the course of events may provide a source of infection for wooden structures, are apparent in the standing trees as fruit bodies along the trunk. They are detectable in logs or in lumber sawed from defective logs by a general brown, friable condition of the wood (under pressure this breaks up into small cubes) or by eliptical brown or white pockets of varying sizes.

Finally, infection may be detected by wood discolorations that indicate the early stages of decay. While these discolorations may be conspicuous in freshly surfaced lumber, they fade quickly upon exposure to light. Fading enables the infection to be carried over undetected into finished lumber and built into new structures.

It is fortunate that comparatively few of the great variety of fungi that attack living trees survive in manufactured lumber. These few are readily destroyed by kiln drying; however, this offers little insurance against their introduction as kiln drying is usually not applied to structural grades of lumber.

Use of wood infected during storage is a common method of introducing fungi into new buildings. This danger is great, because most of the fungi that decay lumber in storage are active destroyers of wood in buildings.

The most likely source of lumber contamination is a poorly managed storage yard, whether at the original mill, an intermediate yard or at the site of construction. Failure to follow good piling practices that will keep the lumber piles dry and free from contact with the ground or contact with previously infected wood may lead to contamination and to decay when the lumber is put to use. Some kinds of fungi, when introduced into a building by one of the methods just described, will remain alive for many years.

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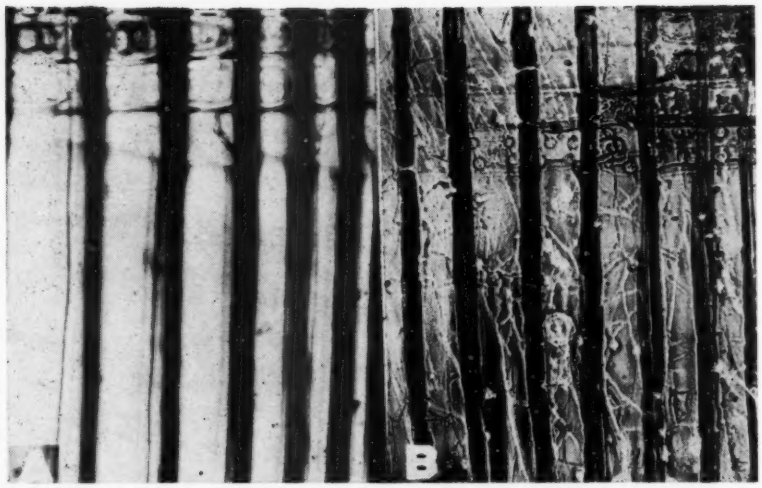

Figure 7. Thin sections of white pine wood photographed through a microscope (enlarged 280 times). **A.** Wood that is uninfected. **B.** Wood that is infected with a wood rot fungus.

though infected lumber is used in construction active decay will not result as long as the moisture content of the wood remains below about 20% of the dry weight. Since 20% is a considerably higher moisture content than is found in normal dry buildings, damage will not occur unless moisture within the structure is raised abnormally. Control of moisture then becomes the key to control of decay.

● Conditions Leading to High Moisture Content

A variety of factors enable the amount of moisture within a building to rise to the point where decay may occur. Enough moisture is absorbed by wood in contact with the soil to allow fungus growth; consequently, all untreated wood resting on the soil may be expected to become quickly infected and rapidly decayed. This is true whether the exposed wood is part of the structure itself, or is present as concrete forms, scaffolding, or merely scraps thoughtlessly left after construction was finished.

Wastewood in contact with both the soil and building provides a bridge by which decay fungi may enter and establish themselves within the structure. High humidity in the building may also raise the moisture content of the wood to a point that will enable decay to start from some of the sources mentioned previously.

Buildings located on wet, poorly drained sites where proper moisture barriers are not provided and where adequate provision is not made to dissipate the moisture or to circulate the air under the building are especially liable to dangerously high humidities. These conditions are found in newer buildings more often than in old, because modern tight construction results in higher inside humidities thus reducing the capacity of the rooms of the buildings to dissipate sub-floor moisture.

If dry lumber is used in original construction and the building is allowed to thoroughly dry out, high humidities alone will not enable decay to start. But once decay has begun, high humidity will greatly hasten its spread.

When the vapor content approaches saturation, even slight changes in temperature will cause condensation on sills, plates and other cool surfaces. During winter months in coastal climates this condition is very bad. It is especially severe where sub-floor temperatures are allowed to rise as, for example, follows plugging the vents in the foundation. Closing these vents leads to increased vapor in the air, air stagnation and condensation, making decay almost inevitable.

Fungus spores germinate readily in the condensed moisture, and their hyphae penetrate the wood. If the humidity remains high, little additional moisture is required to sustain growth, because some fungi are able to utilize the water that forms as an end product of the rotting of the wood. The fungi thereby become independent and can continue their activity away from the soil. Dangerously high humidity conditions occur most often under floors, but also may occur in walls or roofs where some faulty fea-

ture of construction leads to condensation.

Before leaving the subject of accumulation of moisture in buildings, it should be pointed out that leaks of various kinds result in wetting of wood, and subsequent decay. Leaking roofs, walls or leaks around the eaves cause decay problems as do plumbing leaks and condensation from pipes. The extent of the damage or size of the decay area is usually much smaller where leaks are involved than where wood moisture is raised by high humidity in the surrounding air.

● Condition of the Fungus In Wood

The condition of the fungus in infected wood is of concern to the pest control operator and is briefly mentioned in closing. Figure 7 shows thin sections through sound (A) and decaying (B) pine wood enlarged 280 times. In picture B the irregular fungus threads (hyphae) are seen running in various directions within the wood cell cavity (lighter areas between the dark bands which are cells walls) and penetrating the walls. Enzymatic action enables passage from cell to cell and continues to eat away the wood, enlarging the hole to a diameter many times that of the hypha. Similar action occurs along the length of the hyphae lying against the cell walls.

This eroding action reduces the quantity of wood and is accompanied by a proportionate loss of strength. Wood in this condition may show no outward sign of decay.

Other enzyme action (usually cellulose dissolution) uniformly removes wall components at first without apparent reduction in the space occupied by the cell wall materials. Ultimately, however, dissolution advances to the point that the residual lignin will no longer fill the space occupied by the normal wall and the diagonal "shrinkage cracks" shown in the upper left part of picture B appear. At this stage outward decay is apparent, and under pressure the affected wood is reduced to a brown, friable mass.

As decay progresses through the infected timber, the wood in the condition shown in picture B is conspicuously decayed, but the wood, several inches in advance of this area may appear sound. This apparently sound wood, when examined with a microscope, usually proves to be in the condition shown by B, the area away from the shrinkage cracks. Still further in advance are areas where the fungus appears but erosion of the cell walls has not become apparent.

Finally, before a point is reached at which the wood is sound and appears as in picture A, there is an area in which only the initial invading hyphae are found. With some fungi the transition from obviously decayed to certainly sound wood may extend over six or more feet. With the common dry rot fungus the distance is from 1½ to 2 feet.

For this reason, if the pest control operator does a dependable job of cleaning up a decay infection, he must remove all apparently normal wood for a distance not less than two and one-half feet beyond the marginal zone between the apparently normal and the noticeably decayed wood. Thus, the operator, who removes decaying wood from a threatened building, like a surgeon removing a cancer, must cut a safe distance beyond the last visible evidence of infection in order to prevent the trouble from reoccurring.

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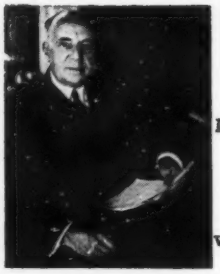


BORER LINES

by

Dr. Thomas E. Snyder

Consultant on Wood Boring Insects and Wood Preservation

Termite Control in Venezuela

The larger cities of Venezuela have modern concrete-and-steel buildings of the latest tropical design; they are rapidly growing in area and population and there is constant tearing down of old structures and progressive construction of new. Caracas, the capital, has a population of one million. It is divided into the old and new cities with many beautiful suburbs. It nestles in a valley dominated by the verdant mountain "El Avila" 10,000 feet above sea level and over 6000 above the city. Before landing by plane at Maiquetia airport, about 45 minutes from Caracas, it did not seem possible that there could be a large enough level area for runways.

Venezuela has climates ranging from tropical to mild. In November and December I flew east over 1000 miles of northern seacoast from Maracaibo to Margarite Island and inland to Barcelona, Maracay, Valencia and Caracas. While the rainy season is from May through October, there were still heavy rains in November and early December.

Construction is of the concrete slab-on-the-ground type in the case of residences. Foundation walls may be of concrete, concrete or tile blocks, or brick (covered with stucco), or field stone. Flooring is of tile. There is no frame construction, and very little timber or lumber is used since it is scarce and expensive. In some cases the roof timbers or girders are of wood.

In the ancient town the walls may be of 'dobe covered with cement. The red tiled roof is laid on 4 inches of earth resting on tightly joined split bamboo over saplings. There is an air space of 18 inches, with a ceiling of paper or wallboard. The floor is very thin tile over earth.

Of the 15 known termites of Venezuela, the principal species which damage buildings are the subterranean termites **Heterotermes convexinotatus** (Snyder), two species of **Nasutitermes**, and **Microcerotermes exiguus** (Hagen) in that order of destructiveness.

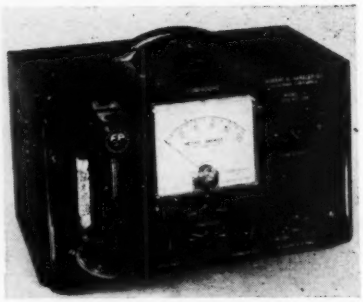
There is a high incidence of infestation but not much serious structural weakening. Entrance is through expansion joints with no or penetrable filler and through cracks in or poor mixes of concrete. Earth-like shelter tubes are seen on walls and ceilings and shed wings are found in windows or in spider webs. Damage is to panels, baseboards, door and window frames, roof girders and to stored material. The drywood termite **Cryptotermes brevis** (Walker) damages door and window frames as well as furniture, especially along the coast. Small holes in wood and pellets of digested, excreted wood and shed wings are evidences of infestation.

In the ancient type of 'dobe construction, infestation may be from the earth, or termites may become established in the damp walls with no ground contact, or "swarmers" may go to the moist layer of earth in the roof and extend tubes down the walls.

Control work is much the same as in the United States. Drilling foundations and injecting chemicals into the soil, either laterally or vertically, depending on the height of the slab with relation to the grade, is the standard method. In the case of 'dobe roofs, they are either replaced or chemical dust is pressure blown into the layer of earth. Chlorinated hydrocarbons are used in emulsion form, and where great penetration is necessary, a low percentage of ethylene dibromide is added.

There is pre-treatment of the soil with chemicals before the slab is poured, in the case of new construction.

Where there is drywood termite damage, badly eaten wood is removed and slightly damaged wood is chemically treated. Furniture and books are fumigated in tight chambers with methyl bromide gas, circulation being provided with fans.



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Unusual termite display attracted attention of hundreds of Bostonians who saw evidence and facts about termite damage in window exhibit at Boston's Federal Savings and Loan Association. Termite literature was available inside the bank and response was "quite amazing" reports R. L. Keenan, vice president of Waltham Chemical Company, whose firm sponsored the display.

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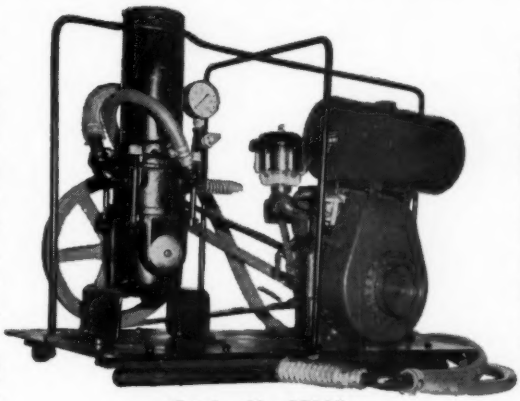

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Sanitation Standards In Restaurant Pest Control

Based on a talk presented by
J. ROBERT CAMERON
Director, Division of Environmental Sanitation
Denver, Colorado
at the 1955 NPCA Convention

Even though great improvements have been made in the sanitation standards of the food industry, including new processes of pasteurization, freezing, precooking and packaging, the opportunity for food contamination to occur through insanitary practices and insanitary conditions still exists. Reduction in the potential dangers of food contamination and food poisoning is being made through continual improvement by the food service industry and constant vigilance on the part of public health officials.

● Standards Are Not Uniform

Unfortunately, one of the greatest deterents to good restaurant sanitation standards is the lack of uniformity among the thousands of restaurant sanitation ordinances in the states, counties and municipalities throughout the country. Public health people, themselves, must accept a large share of the blame for this condition. Also, the restaurant industry has been known to bring pressure on governmental bodies to establish protective and discriminatory legislation in some areas. In these cases the restaurant industry itself must shoulder some of the responsibility for the lack of uniform standards.

One of the first major steps to obtain uniformity of standards was taken in 1934 by the U. S. Public Health Service with the development of the first "Recommended Ordinance and Code Regulating Eating and Drinking Establishments." Since that time, there have been four major revisions to this Code. Revisions were made in an attempt to keep the Code up to date with modern trends in such major items as basic building construction, construction of food service equipment, refrigeration, dishwashing procedures and, of course, pest control methods.

● Code Covers 18 Items

The recommended Code has 18 major items covering such things as floor and wall construction. lighting, ventilation, water supply, disposal of wastes, etc. With the exception of one or two, these items have a direct or indirect relationship to the control of insects and rodents in restaurants.

Item 3 of the Code establishes standards for the protection of doors and windows against the entrance of flies. We should not forget that the common housefly is still one of the major sources of the transmission of enteric diseases, and still presents a large problem to the restaurant operator.

The use of repellent fans to replace the screen door is continuing to increase. There is still much that we don't know about the sizing and location of repellent fans which will adequately prevent the entrance of flies, but which also are not objectionable to customers passing through the doorway.

Item 6 covers the subject of toilet rooms. The standards still prohibit direct openings from toilets into areas where food is handled or stored. This is a subject of controversy among health officials themselves. Some believe that the requirement for a vestibule or entry-way between the food handling area and a toilet room reduces the possibilities of flies passing from the contaminated toilet into the food handling area. However, this ruling is a negative approach to the problem. Fly control measures should be effective enough to make this type of requirement unnecessary.

Items 9 and 10 cover the construction and cleaning of the restaurant utensils and equipment. This includes such items as display cases, counters, shelves, tables and refrigerators. The experienced sanitarian and PCO know that cracks, crevices and hidden corners make an ideal place for insect infestation.

Standards for the storage, display and serving of food and drink are set forth in Item 15. This item deals directly with vermin infestation and reads as follows:

"All food and drink shall be so stored, displayed and served as to be protected from dust, flies, vermin, depredation and pollution by rodents, unnecessary handling, droplet infection, overhead leakage and other contamination. No animals or fowls shall be kept or allowed in any room in which food or drink is prepared or stored. All means necessary for the elimination of flies, roaches and rodents shall be used."

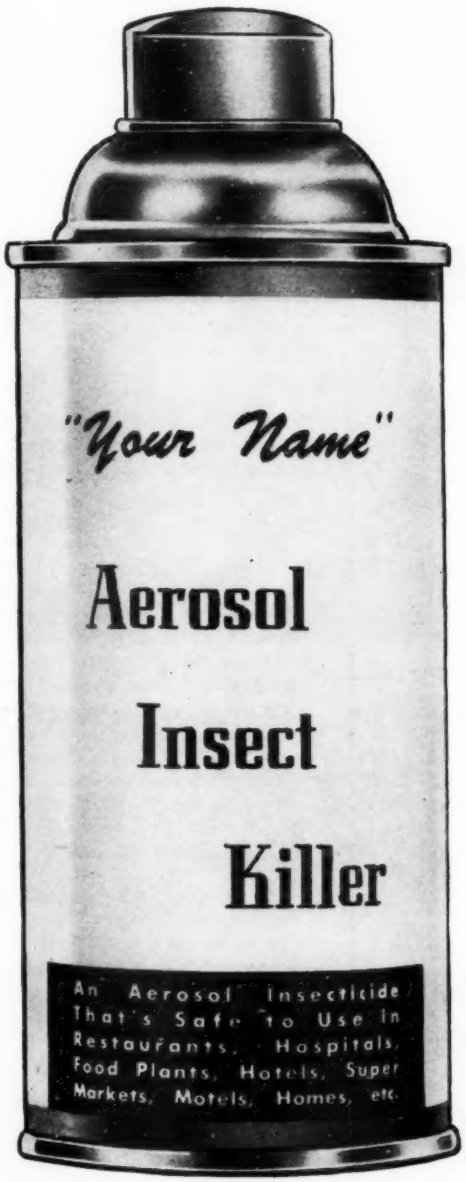
The Code also states, "Evidence of the presence of rodents, roaches, ants and other vermin shall be considered as a violation of this item." It goes on to say:

"All supplementary means necessary for the elimination of flies, roaches and rodents are employed. For the elimination of flies, fly-repellent fans, fly-paper, fly traps or fly-killing sprays or powders may be used. All poisonous compounds used in the extermination of rodents or insects shall be so colored as to be easily identified; however, poisonous substances should be used with extreme caution and compounds harmless to humans should be substituted wherever possible."

● Safety Hasn't Kept Pace

In this area the public health sanitarian and PCO must work together to reduce the dangers of food contamination and human poisonings through the improper use of insecticides and rodenticides. Revolutionary changes have occurred in the development of pesticides since World War II. New materials and methods have developed so rapidly that knowledge concerning toxicity of pesticides has not kept pace with their production and development.

Unfortunately we still continue to encounter practices which endanger the public health and safety. In Colorado recently, a man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working in a meat market drank from a whiskey bottle that he found on the shelf of a walk-in refrigerator. The bottle contained 1080.

In another case, while one of our Denver sanitation inspectors was in a meat cutting room several weeks ago a PCO started to spray chlordane throughout the area while the meat was exposed. Our sanitarian stopped him. For safety's sake, when you apply a chemical know the product, its limitations and dangers; don't take chances; follow the recommendations of your professional association; and abide by the regulations of your official health agency.

● NSF's Accomplishments

In 1945 the National Sanitation Foundation was organized. One of the major functions of the Foundation has been to obtain uniformity of standards for such things as food service equipment, dishwashing machines, soda fountain construction, water heating, etc. The work of the Foundation has had a great influence on the unification of food service sanitation standards throughout the country.

Many of the NSF's accomplishments have had a direct effect on the PCO's work in restaurants. In 1948 the NSF held the National Sanitation Clinic at its headquarters at the University of Michigan's School of Public Health in Ann Arbor. This was the first time in the history of public health that such a clinic had ever been attempted.

It was at this clinic that the "cornerstone" was laid for the establishment of uniform standards for food service sanitation. Since that time, uniform standards have been created by various committees of the Foundation. These standards spell out in detail the manner in which restaurant equipment should be constructed and installed in order to comply with good sanitation practices. Through the Foundation's Testing Laboratory, manufacturers of restaurant equipment can make application for approval by the Foundation. If the equipment meets the Foundation's standards, it receives a seal of approval. This seal is recognized and accepted by the majority of public health agencies, architects, equipment installers and others who are directly interested in the sanitation of eating and drinking establishments in much the same manner as the Underwriters' Laboratory Seal of Approval is recognized and accepted by architects, contractors, insurance underwriters and fire prevention and building officials.

What does this mean to the professional PCO who is employed to service an eating establishment? As examples here are several items in the standards which reduce the possibilities of infestation by insects and rodents.

Standard Number 1 establishes detailed recommendations for the construction and installation of soda fountains and luncheonette equipment. No PCO who has been called upon to eliminate an infestation in a drug store or luncheonette need be reminded of the numerous cracks, crevices and vacant spaces which can be found in a soda fountain or sandwich preparation unit where food particles, melted ice cream, syrup, and similar debris accumulate and create ideal places for insects and rodents to harbor. It is this type of construction and condi-

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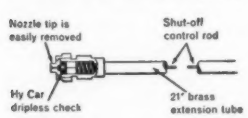

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tion which Standard No. 1 attempts to eliminate.

On page 16 of the Standard there is a brief, but significant section on the requirements for the external enclosure of the soda fountain unit. It reads:

"3.30 **External Enclosure** (4 sides and bottom) shall be mechanically bonded and all joints or seams shall be sealed against the entry of vermin."

Another section directly related to the problems of pest control in and around soda fountain and luncheonette equipment (pages 19-20) covers the elevation of the equipment above floor level, construction of kick plates, and the installation of legs and feet on fountain and luncheonette units. It reads as follows:

"3.45 **Distance Off Floor:** Effective January 1, 1954, the minimum distance between the bottom of creamers and of ice cream cabinets, as defined in item 10.03 and 10.04, and the floor shall be 6 inches or the unit shall be sealed to the floor with mastic or other suitable material.

"Pending the development of large capacity compact ice cream containers of less height than those now in use which will permit the use of shallower ice cream sleeves in creamers and ice cream cabinets as defined in Item 10.03; a minimum of 2 inches space between the bottom of such units and the floor is acceptable provided that such space shall be so closed as to prevent the entrance of debris. Closing members shall be so applied as to be readily removed or opened to permit access to the space beneath for inspection, servicing and cleaning; or shall be effectively sealed to the floor with mastic or other suitable material.

"3.451 **Kick Plates:** If kick plates are provided, they shall be built so that they can be readily removed or opened to permit access to the space beneath the unit for inspection, servicing and cleaning.

"3.46 **Legs and Feet:** Shall be sufficiently rigid to provide support with a minimum of cross bracing, and so fastened to the body of the equipment and so shaped at floor contacts as to prevent the accumulation of dirt and the harborage of vermin. All hollow sections shall be sealed. Where such legs and feet are made adjustable, they shall be of simple design, free from embellishments."

Standard No. 2, which establishes recommendations for construction and installation of food service equipment, also reduces the number of construction features which will provide harborage for vermin.

"3.06 **Reinforcing and Framing:** Reinforcing and framing members not totally enclosed or within walls are to be used in such manner as to be easy to clean. All framing members shall be so used as to eliminate raceways or harborage for vermin. The ends of all hollow sections shall be sealed.

"Horizontal angle reinforcing and gussets shall not be used where food or garbage may accumulate thereon. Where angles are used horizontally they shall have one leg turned down wherever the nature of the equipment permits, or shall be formed integral with the sides as for use with removable shelves or for drawer slides."

Standard No. 3 covers design and operation of spray-type dishwashing machines. Here, too, can be found standards which eliminate construction that encourages pest harborage.

● PCO Must Meet New Challenges

Let's take a critical look at the future. Restaurant sanitation standards are only a part of a vast food industry that is growing by leaps and bounds. As the food industry grows, new problems of production, processing and maintenance arise to confront management and those persons closely allied with it, including the PCO and sanitarian. What are we doing to meet these new challenges?

The approach to improved sanitation standards must be one that is positive, not negative. Not many years ago the approach by the health department sanitarians was to find the insanitary conditions and then "lower the boom" on management. This was a negative approach.

Previously, the practice of reviewing plans by the health department sanitarian before a restaurant was to be built or remodeled was unheard of in many communities. The restaurant owner spent his money on an expensive building and costly equipment, and when, over a period of time, he didn't or couldn't keep it clean the inspector descended upon him with orders to "clean up or close up."

Sanitarians realized that this was a negative approach and that a positive prevention program was needed if the problems of sanitation in the restaurant industry were to be surmounted. The medical health officer who waits for a disease to strike and then dashes out with his vaccine to inoculate the population is certainly not operating a good preventive medicine program. In the same light, the sanitarian cannot wait for the insanitary conditions to occur and then run out with his legal warrant or closing orders. His approach must be a positive program of prevention if it is to be truly successful.

It is for this reason that many

A new aerosol room deodorizer which is reportedly completely odorless has been developed by the Tru-Pine Co. Called Odorless Sprayway Room Deodorant, it is said to leave absolutely no odor even when generously and repeatedly sprayed in confined areas. In addition, it is said to reduce air borne bacteria, including those associated with common respiratory infections. This product is manufactured by the Tru-Pine Company of 7644 Vincennes Avenue, Chicago 20, Illinois.

health departments over the past years have adopted the U. S. Public Health Service's standard ordinance and have supported the National Sanitation Foundation's program to obtain uniformity of sanitation standards. The review of construction and equipment installation plans by the health department before the restaurant is built and the application of the NSF standards to basic sanitation requirements have become "standard practice" in many health departments. Of course, the health department still has a basic responsibility for the enforcement of sanitation laws and in some cases, it is still necessary to invoke the power of these laws. But legal action has become almost secondary to the positive program of preventing the insanitary conditions before they occur.

● Adopt Positive Approach

PCOs must also adopt a positive approach to the problems of vermin infestation and sanitation. The stories of the PCO leaving a few roaches or mice in the establishment he is servicing as "seed" to insure himself of a return call in the future have long been relegated to the joke book and cartoon column. Yet, emphasis is still being placed on killing pests rather than preventing them. Practically every article on pest control methods emphasizes the need for basic sanitation, yet this

is often touched on too lightly or brushed over by the operator who goes on to read the article with the thought in his mind, "Sure—sure I know that sanitation is important, but how do I kill the pests when they get into the restaurant?"

Sometimes it looks like the pest control industry has backed itself into a position that is difficult to get out of. The restaurant operator and the baker or flour mill operator have looked upon the PCO as the man they call when there's trouble, and not the fellow that can be summoned to help prevent an infestation before the situation gets out of hand.

Prevention is nothing new to many PCOs, who have been providing such service for a number of years. However, many operators are not sold on such a service. Of course, there are many reasons for this. Some just don't want to. Others fear they don't have the ability to tackle an expanded program and feel that it is unwise to venture into an unexplored territory. A few have tried it and found that it didn't pay off because of many reasons. Perhaps they couldn't "sell" the idea to industry or perhaps local health departments weren't supporting a good sanitation program that created enough incentive for the food operator to see the necessity of employing their services. All of these are reasons, good and bad, for not venturing into sanitation service in addition to pest control. However, the increased participation of the PCO in sanitation work will continue to expand during the coming years.

This industry should develop a sanitation program on a national scale; supported by a positive approach. PCOs have found that attempting to cure a situation instead of preventing it doesn't always pay off in the long run. The people in industry and the general public will increase their demands for the positive approach to improved sanitation and PCOs and sanitarians have an obligation to comply with that demand.

7 More Fined for Filth

Food and Drug Administration inspectors have clamped down on 7 more food processors whose products contained insect and rodent filth. In each of the following cases, fines were levied for violation of the Federal Food, Drug and Cosmetic Act.

A West New York, N. J. bakery fined $100 for cookies containing rodent hairs prepared under insanitary conditions.

A bakery in Troy, N. Y. fined $1,000 and each individual fined $250 for distributing products containing insect and rodent hair fragments and prepared under insanitary conditions.

Candy containing insects, insect fragments, and cat hairs, prepared under insanitary conditions cost a Chicago, Ill. candy company $300 in fines.

Another candy firm in Philadelphia, Pa. was fined $250 and each individual $25 for candy that contained insect and rodent filth and that was prepared under insanitary conditions.

A Lowville, N. Y. firm fined $500 for cheese which contained insects, cow hairs, insect-rodent hairs, and manure fragments; made from dirty milk under insanitary conditions.

An Indianapolis, Ind., peanut butter manufacturer fined $400 and court costs of $37.80 for insect and rodent filth in the product which was prepared and packed under insanitary conditions.

A $3,000 fine levied against a Philadelphia, Pa. processor for insect and rodent filth in rice, prunes, split peas, poppyseeds, and sundried peaches held under insanitary conditions.

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What's NEWS In The Industry

USDA Mosquito Tests In Irrigated Rice Fields

Further Department of Agriculture sponsored tests with water soluble insecticides to destroy mosquito larvae in irrigation water have proved successful, the Department's reports. (See PC, Nov. '55, p. 40). Recent experiments showed that less than an ounce of one insecticide, when added to a million gallons of irrigation water as it flowed onto rice fields, was enough to kill all larvae of the predominant mosquito species present in the water.

Parathion was the most effective of four chemicals tested. Though not normally soluble in water, parathion was "solubilized" by mixing it with a chemical emulsifier. This concentrated solution readily diffused throughout the irrigation water, the Department says. Other insecticides that provided control of **Psorophora** mosquito larvae in the tests were L 13/59, OS 2046, and DD-VP. Respectively they gave 100% kills at dosages of one-fourth gallon, one-half gallon, and one-tenth gallon for each million gallons of irrigation water. Only 0.01 gallon of parathion was required in each million gallons of irrigation water to achieve complete kill. According to the USDA, with such low doses of this generally available phosphorus insecticide, treatment costs are low and there is no toxic hazard to man or livestock.

Although research results have been promising, the USDA is not recommending these methods and materials for mosquito control until more experimental work is done.

Bait Stations for Flies

Bait stations look promising for future fly control, reported three Department of Agriculture entomologists at the recent Entomological Society of America meeting in Cincinnati.

J. S. Keller, H. G. Wilson, and Carroll N. Smith, entomologists stationed at the Orlando, Fla. laboratory, of the USDA's Agricultural Research Service, said that simple bait stations consisting of a piece of screen wire (4" x 6") covered with a slurry of bait (a mixture of sugar, agar, sand, and insecticide) and attached to a stick that can be shoved into the ground or stapled to a fence post or other structure, show real promise. However, the Department is not yet recommending use of bait stations.

Two per cent concentrations of L 13/59, malathion, chlorthion, and American Cyanamid 4124 have proved effective. These insecticides are not generally considered long-lived, but when mixed with a bait and concentrated on a small surface they remained toxic to flies for weeks rather than for days.

In dairy barns, from five to 40 bait stations containing the L 13/59 insecticide or malathion reduced fly populations between 85 and 99% the first day, and provided effective control for four to 10 weeks.

When 50 to 100 similar stations were used in poultry houses containing caged laying hens, fly numbers were cut by 73 to 98% the first day and remained at a low ebb for three to 14 weeks. In limited poultry-house tests, bait containing American Cyanamid 4121 reduced fly numbers 85% the first day and provided 93 to 99% control for four weeks.

L 13/59 provided effective control of flies in Florida feed lots and was equally as good as malathion when tested near various livestock shelters on Kansas and Nebraska farms. In the latter tests, control was harder to establish, ranging from 16 to 82% the first day, but generally reaching 90% and higher after two to five days.

Over 92 pest control operators and guests attended last year's Virginia Polytechnic Institute PCO Short Course, held at Blacksburg, Va., Nov. 9-11, for the largest attendance in the history of the conference. During the meeting delegates heard talks on rodents, rat-proofing, fly control, fly control chemicals, and termite control. Speakers included: R. M. Russell, Orkin Exterminating Co. technical director, Atlanta; John C. Jones, USF&WLS, Washington, D. C.; R. E. Dorer, Virginia Department of Health, Norfolk; J. M. Grayson, E. M. Raffensperger, A. A. Muka, E. C. Turner, all entomologists at VPI; R. E. Johnson, American Cyanamid Co., Richmond; J. L. Horsfall, Geigy Agricultural Chemicals, New York; James Lanier, Chemagro Corp., New York; S. H. Benedict, Shell Chemical Corp., New York; and Dr. Ralph E. Heal, NPCA executive secretary, New York. At a Virginia PCA business session the following association officers were elected for 1956: president, B. F. Dodson, Dodson Brothers Exterminating Co., Lynchburg; vice president, G. J. Hart, Hampton Roads Exterminating Co., Norfolk; and secretary-treasurer, C. Eley Cole, Orkin Exterminating Co., Newport News. Dr. J. O. Rowell, of VPI, was chairman.

J. V. Blankmeyer has been appointed a staff sanitation consultant for the Sanitation Division of Arwell, Inc., of Waukegan, Ill. Mr. Blankmeyer was formerly with the Pabst Brewing Co., where he served as sanitation engineer in charge of sanitation programs for all Pabst divisions. He will be headquartered at company offices in Waukegan.

Trimbos Elected Texas Head

Members of the Texas Pest Control Association met in Galveston November 17, 18 and 19 for the group's 11th annual convention. Some 170 operators and guests attended this year's meeting at the Galvez Hotel which saw Dr.

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One pair of rats eat 27 pounds of food during six months. Each pair eliminate 25,000 droppings in six months, 1½ gallons of urine, and shed 1,000,000 hairs. This filth contaminates more food than the rats eat. Each pair of rats contaminate a bushel of grain daily!

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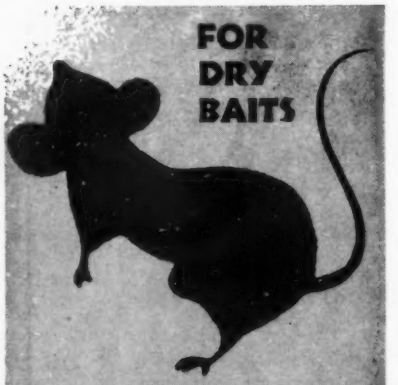

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C. A. Trimbos, Protex Service, Inc., Dallas, elevated to the 1956 presidency.

Other officers tapped to serve during the coming year are executive vice president, F. E. Shoop, Texas Termite Control Co., Wichita Falls; executive secretary, R. L. Showalter (re-elected), Miracle Pest Control, Abilene; and treasurer, L. A. Blackwell, Texas Termite Control Co., Wichita Falls.

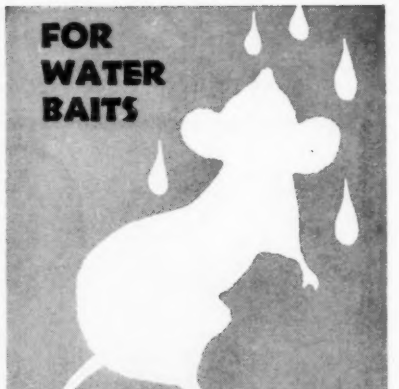
Regional vice presidents elected during the meeting are B. L. Jacks, Gold Seal Pest Control Co., Houston; Joe D. Preston, Orkin Exterminating Co., Houston; Vernon Bryant, Laredo; W. H. Robinson, Southwest Pest Control Co., San Antonio; E. H. Denton, Denton Pest Control Co., Tyler; S. E. Livingston, City Exterminating Co., Dallas; and L. E. McClish, State Pest Control Co., Amarillo.

A well-rounded program featuring talks on both business and control problems included information on: human relations, by Jim Trivette, of the Dale Carnegie School, Houston; selling, by J. G. Moritz, of Bellaire, Tex.; industry news, by Dr. Ralph E. Heal, NPCA Executive Secretary; flea and housefly control, by Manning Price, Texas A. & M. Entomology Department; pesticide toxicities, by Dr. Don W. Micks, University of Texas Medical Branch, Galveston; biology of the German roach, by Dr. O. W. Rosewall, Louisiana State University, Baton Rouge, La.; recent developments in resistance, Dr. Ralph E. Heal; liquid fertilizers and soil fumigants, by Dr. G. B. Truchelut, Dow Chemical Co.; and panel discussions covering termite control, legislation and resistance.

The 1956 Texas Convention will be held in Amarillo.

Kansas PC Committee

The Kansas Pest and Termite Control Association has elected a seven-man committee to act as unofficial advisors to state officials in enforcement of the Kansas Pest Control Act. The seven men are: Dr. Harlan Shuyler, Conservation Industries, Kansas City; Robert R. Schendel, Schendel Pest Control, Topeka; Bill J. Hawks, Inter-State Exterminators, Inc., Wichita; M. S. Buckley, Industrial Fumigant Co., Kansas City; Dick Evans, Dick Evans Pest Control, Wichita; John Penland, Orkin Exterminating Co., Dodge City; and Ervin Syfert.



anti-coagulant rat and mouse killer

PIVALYN®

Pivalyn is the only water soluble anti-coagulant which combines top acceptability, resistance to molding and equal effectiveness in hard and soft water. Used alone in place of the older cereal-type baits, this superior water-soluble anti-coagulant has proven its effectiveness in areas from coast to coast and under widely varying conditions on farms, in homes and in business establishments.

Simple to use, it is packaged for the PCO as a 4.4% concentrate in convenient individual foil packets. One Pivalyn packet to one quart of water—that's all there is to it! As a "taste-treat" for rodents, and under conditions of difficult control, sugar may be added to the Pivalyn solutions.

Pivalyn's exclusive mold-resistant action provides excellent keeping qualities. Even with the sugar added (and laboratory tests have indicated as high as 10 to 1 acceptability over plain water by the addition of two tbsp. of sugar per quart), Pivalyn water baits normally remain mold-free for periods up to eleven weeks.

A worthy companion to Pival — the new and improved rodenticide for use in dry baits — which has proven itself by your reorders, Pivalyn is ready to go to work for you. Packaged for the PCO in units of 100 packets per box.

CHEMICAL SPECIALTIES MOTOMCO, INC.

MOTOMCO, INC.
10 MURRAY ST., NEW YORK 7, N. Y.

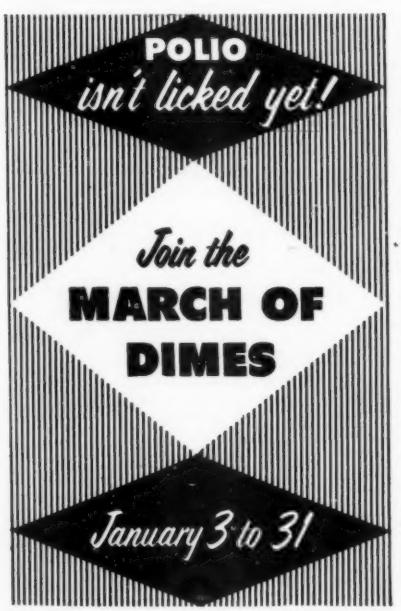
Banquet scene of first annual meeting of the Nebraska Association of Pest and Termite Control Operators which was held in Lincoln last month. Roy Mason, Omaha, was elected president.

Mason New Nebraska Prexy

Roy Mason, Mason Pest Control Service, Omaha, was elected president of the Nebraska Association of Pest and Termite Control operators at the group's first annual meeting held in Lincoln last month. Other association officers are: vice president, John Penland, Orkin Exterminating Co., Dodge City, Kan.; and secretary-treasurer, George Preece (re-elected), Mid-State Pest Control, Lincoln. Directors elected include John P. Linn, Industrial Termite Control, Inc., Omaha; Ward A. Combs, Presto-X-Company, Omaha; and Bill Spradlin, Bill's Pest Control Service, Plattsmouth.

During the one day meeting delegates heard talks on advertising, rat control, legislation, pigeon control, insurance, accounting, resistance, fly control and Veterans Administration termite inspection requirements.

Speakers included: John Henry, manager of Omaha's Better Business Bureau; Joseph Olewine, of the Omaha Health Department; H. Dean Garwood, entomologist with the Kansas Entomological Commission; Denver, Colorado PCO Maurice Oser; O. Dean Ames, of the Byron Reed Co.; certified public accountant James B. Hollander, of Omaha; Robert E. Roselle, extension entomologist with the University of Nebraska; Henry Isherwood, Antimite Co., St. Louis, Mo.; Dr. E. A. Rogers, director of Nebraska's Department of Health; and PCOs John E. Penland and Ward A. Combs.



Suppliers' Staff Changes

Cecil M. Crutchfield has been appointed district manager for the California Spray Chemical Company's Mississippi Delta area. He will be headquartered in Troy, Alabama. In other company shifts, **Earl L. Stripling, Jr.** becomes southeast district manager and **James P. Toffaleti** takes over as district manager for the south central district. Mr. Stripling will be located in Goldsboro, N. C. and Mr. Toffaleti in Shreveport, La.

George R. Williams has joined the staff of Diamond Black Leaf Co., Cleveland, Ohio, as a sales and service representative.

E. I. duPont de Nemours & Co. has announced the appointment of **Henry C. Andersen** as a sales representative for the firm's garden chemicals line in the Chicago area.

Benjamin Stonoga has been named sales supervisor of the Pennsylvania Salt Manufacturing Company's southwest territory.

80 at PEA Banquet

Last month's annual banquet of the New York Professional Exterminators Association drew 80 members and their guests to the affair held in New York City's historic Fraunces Tavern where George Washington bade farewell to his soldiers.

Robert G. Bloch, retiring president, arranged the program at which NPCA's secretary Dr. Ralph E. Heal acted as toastmaster and the national association's president, I. B. Carncross, was guest speaker.

Entertainment included vocal solos by PCOs Fred Loffriedo, Luther Robinson, and the NPCA's Thomas H. Mahon. Dancing brought the evening to a close after 1956 PEA president Kenneth Thompkins introduced his new officers and William Farrell presented a Webcor record player to Mr. Bloch for his two-years of service as helmsman of the greater New York group of PCOs.

Infestation Report

(from page 27)

Blacksburg, and annoying families in area.

GRAIN BEETLES

South Carolina: Saw-toothed grain beetle reported as most serious pest in 40 years at Burris Mills, Anderson County.

GRAIN MITE
(Acarus siro)

Oregon: Large numbers in stored wheat at Prineville recently.

HIDE BEETLE
(Dermestes maculatus)

Virginia: Has recently damaged about a ton of cured pork at Richmond.

INDIAN-MEAL MOTH
(Plodia interpunctella)

Oregon: Infestations common in home-stored walnuts and filberts in Willamette Valley between Eugene and Portland.

LADY BEETLES

Maryland: Swarming in a house in Leonardstown.

OLD HOUSE BORER
(Hylotrupes bajulus)

Maryland: Larvae working in rafters and joists of home, Rockville, Montgomery County. Infesting structural timbers of a new house in Frederick.

PHARAOH ANT
(Monomorium pharaonis)

Maine: Pest in home with floors of pressed wood with sawdust between layers. Ants have been present for over a year.

POWDER-POST BEETLES

Virginia: Have heavily damaged poplar timbers in a residence at West Point.

RICE WEEVIL
(Sitophilus oryza)

Oregon: Common in three of six grain elevators inspected in Portland.

Notebook

TIPS AND IDEAS FROM THE FIELD

False Scorpions

By Joseph R. Gross

"Come immediately, my baby's been bitten by a scorpion and I've just got to have my house fumigated." This is the type of call we've been receiving in our office more and more frequently lately. Or sometimes it's a harassed landlord or rental agent who phones in, "They're driving me crazy over scorpions. Please go over to Mr. Zack's house and see what you think should be done."

Sometimes I find the scorpion scare is real. But for every true case there are 10 or more false alarms.

One the past summer sounded like the real thing when described to me over the phone. The family who called in had been killing several every day since the empty lot next door to their home had been cleared. I just had to help; so I dashed clean across the city.

After a full half hour of searching in and out of doors, there was still no scorpion evidence. But the lady was positive, "I'll even show you the ones we killed," she said. We hunted in the lawns and weeds. Finally picked up five carcasses, too.

About that time, daddy arrived home for his lunch. So I organized a little biology field trip. With daddy, mother and sonny boy, we tramped across about 50 yards of meadow, to the shore of a salt-water tidal pond. As we approached the shore "scorpions" were so numerous we would have been trampling them underfoot but for the speed they traveled in escaping.

Those little **mud crabs** were so thick along the low-tide shore, their scurryings sounded like a heavy rain shower.

This was a rare case. The most common scorpion scares are caused by a little insect less than an inch long. They have pincer-like forceps at the rear. When disturbed, they throw their pincers and abdomen up over their backs in a threatening way very much like a scorpion does when preparing to strike. And those sharp pointed pincers can sometimes penetrate the tender skin of a child.

Nothing dangerous, but **earwig** bites aren't pleasant when you think you are dealing with a poisonous scorpion.

Earwigs were very abundant during 1955 in the Tampa area, so I had a lot of "scorpion" alarms. Happily a good percentage of the calls paid off in general pest control contracts.

Recent Florida PCO Short Course held at the University of Florida, Gainesville, attracted 85 state operators. The two day meeting covered control of such pests as flies, ants, moths, rodents, ticks, spiders, mosquitoes, roaches, termites, and powder post beetles. In other sessions PCOs were brought up to date on insect and damage recognition, legislation, insecticides, rodenticides and fumigants. The meeting wcs sponsored by the Florida Pest Control Assn. and the University of Florida. State PCOs hope to make the meeting a regular yearly feature.

Cite Organic Phosphate Intoxication Treatment

Two University of Illinois scientists have issued a statement to physicians on methods of treating poisonings resulting from exposure to the organic phosphates. Dr. Archer S. Gordon and Mr. Charles W. Frye reported in the **Journal of the American Medical Association** that the best known methods of treatment include the administration of the drug atropine sulfate to control nervous system effects, artificial respiration to treat respiratory failure, and general treatment for other symptoms.

Atropine must be given as soon as possible and in larger than normal doses in order to combat the poisoning, the two men say. A review of 25 cases showed a direct relationship between survival, the amount of atropine given, and the speed of administration.

While an overdosage of atropine produces certain uncomfortable effects, they are not serious, but the consequences of inadequate treatment for organic phosphate poisoning are grave. Therefore, treatment with atropine should tend toward overdosage rather than underdosage, they said.

Other methods of treatment include: application of gas mask and/or removal from the site of the vapors; immediate washing away of any liquid contamination; drainage of excessive bronchial secretions that may block the airway; oxygen administration if necessary; treatment of the eyes with atropine to counteract eye symtoms; and administration of medicine to stop convulsions if they are not controlled by atropine.

Calendar

North Carolina Pesticide School, Raleigh, Jan. 10-11.

New Mexico Pest Control Assn. Monthly Meeting, Santa Fe, Jan. 14.

Northwest Pest Control Assn. Monthly Meeting, Minneapolis, Minn., Jan. 19.

8th Annual Oklahoma PCO Conference, Oklahoma A. & M. College, Stillwater, Jan. 23-25.

Ninth Naval District Pest Control Conference, Building 1-A, U. S. Naval Training Station, Great Lakes, Ill., Jan. 25-26.

15th Southern PCO Conference, Louisiana State University, Baton Rouge, La., Jan. 30-Feb. 1.

20th Purdue PCO Conference, Purdue University, Lafayette, Ind., Jan. 30-Feb. 3.

North Carolina PCO Short Course, State College, Raleigh, Jan. 31-Feb. 1.

16th Eastern PCO Conference, University of Massachusetts, Amherst, Feb. 2-4.

California PCO Conference, Sacramento, Mar. 1-3.

Arkansas PCO Licensing Examinations, State Plant Board, Little Rock, Mar. 5.

Pacific Northwest PCO Conference, Oregon State College, Corvallis, Mar. 4-7.

Alabama PCO Licensing Examinations, Birmingham, Decatur, Gadsen, Mobile, Montgomery, Mar. 20.

National Sanitary Supply Assn. 33rd Annual Convention and Trade Show, Conrad Hilton Hotel, Chicago, Apr. 29-May 2.

USDA Solves Structure Of Pyrethrum Synergist

Chemical structure of sesamolin, a sesame-oil derivative that is the most potent synergist, or booster, known for pyrethrum insecticides, has been determined by Dr. Morton Beroza, a Department of Agriculture research chemist.

According to the Department, Dr. Beroza's discovery is an important advance in continuing USDA research to find better ways to control insects. Use of the compound reportedly gives pyrethrum insecticides greatly increased killing power against house flies and certain other insects, but does not increase their extremely low toxicity to humans and warm-blooded animals.

Sesamolin by itself does not harm insects, but when added to pyrethrum it greatly increases the insecticide's potency, the Department says. The effectiveness or sesamolin as a synergist for pyrethrum was discovered in earlier research by Dr. Beroza.

His discovery has laid the groundwork for (1) development of a satisfactory commercial process for extraction of sesamolin from the oil of sesame seed, a fast-expanding new oilseed crop for the South, or (2) possible development of a synthetic compound for use in insecticides that will duplicate the booster effect of natural sesamolin.

The best commercial synergists, when mixed with pyrethrum in a ratio of 5 to 1, make the insecticide about 12 times more effective against flies than pyrethrum without a synergist, the USDA says. Chemists and entomologists of the Agricultural Research Service have found, however, that mixing sesamolin with pyrethrum in a ratio of only 1 to 1 increases the insecticide's fly-killing power by 31 times. In addition, it boosts the already potent "knock-down" ability of pyrethrum.

Suburban Fly Article

"The trend towards outdoor living and the scattering of urban population outward from big cities into fringe areas, has brought people face to face with a hitherto neglected but large segment of the fly population," writes W. Edwards Brown, of the Diptron Co., in an article entitled, **The Forgotten Fly.**

In this article, Mr. Brown gives specific recommendations for control of suburban flies and offers tabulated data on fly species prevalence in homes. Special emphasis is placed on the use of fly traps.

Copies of the article are available free to PCOs. Just write to the Diptron Co., Inc., 704 West Wisconsin Ave., Milwaukee, Wis.

Fabric Damage Analyzed

How to recognize fabric pest damage and to distinguish between insect attack and burns and mechanical damage is covered in an article which appeared in a recent issue of the **American Dyestuff Reporter.** Reprints of this article, **Identification of Insect Damage on Wool and Related Animal Fibers,** which was authored by Donald J. Ott, of the Geigy Chemical Corp., are available to PCOs.

The 6-page illustrated and documented article covers such items as moth, carpet beetle, and other fabric pest damage; burns; tears, etc.

For reprints, write Geigy Agricultural Chemicals, 89 Barclay St., New York 8, N. Y.

We Are Privileged to Announce the Appointment of the Following

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B & G COMPANY

Plumsteadville, Pennsylvania

"Serving the Pest Control Industry"

Careers in Entomology

A booklet designed to encourage more young people to enter the field of entomology has been issued by the Entomological Society of America. **Opportunities in Professional Entomology** is a 12-page, illustrated pamphlet which describes all of the various careers open to university-trained entomologists.

Single copies of this publication sell for 25c. Prices for larger orders are as follows: 25 copies, $5; 50 copies, $8.75; 100 copies, $15; 500 copies, $60; and 1000 copies, $100.

Send all orders to executive secretary, Entomological Society of America, 1530 P Street N.W., Washington, D. C.

Package Research Outlined

The Status of Federal Research on the Development of Insect-Resistant Packages, is the title of a bulletin just issued by the U. S. Department of Agriculture's Stored-Product Insects Laboratory, in Savannah, Ga. Authored by USDA scientists, Hamilton Laudani and Dean F. Davis, the 5-page publication covers all phases of package insectproofing techniques.

For free copies of this booklet, which was reprinted from the official journal of the Technical Association of the Pulp and Paper Industry, write the USDA Laboratory in Savannah, Ga.

3 Elected to NACA Board

James D. Hopkins, president of the Hopkins Agricultural Chemical Co., Madison, Wisconsin, has been elected to the board of directors of the National Agricultural Chemicals Assn. Other new association directors are Loren P. Scoville, Chlorinated Products Division, Diamond Alkali Co., Cleveland, Ohio; and William J. Lipfert, Woolfolk Chemical Works Ltd., Fort Valley, Ga. All 3 were picked for 5-year terms.

Letters

(from page 6)

tomers. Products liability insurance is only necessary due to this when the PCO sells products to the public, which the public uses themselves.

We believe this classification is prevalent with all companies which are under the jurisdiction of the National Bureau of Casualty Underwriters. We do not know this for certain, since we can only say that all policies written through this office are so worded.

Policies written through this office already void the exclusion relating to property in the care, custody and control of our insureds. However, it is not feasible for companies to void the exclusion relating to water damage.

Jerry H. Goodman
B. & D. A. Weisburger
New York City

Primer

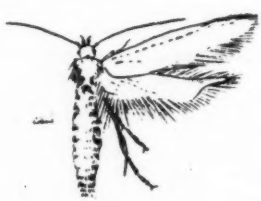
LOOK ALIKES: 13

Prepared by DR. MARION E. SMITH and HSIU-FU CHAO
Entomology Department, University of Massachusetts, Amherst

Clothes Moths and Grain or Other Moths

Often different insect species so closely resemble each other that correct identification is difficult. These columns are designed to help PCOs rapidly and accurately tag the pest involved. This month the authors take up clothes moths and grain or other moths. In December, physical differences between the indian meal moth, Mediterranean flour moth and angoumois moth were described. Keep these columns on hand for your entomological library and for serviceman training.

CLOTHES MOTHS



GRAIN OR OTHER MOTHS

CLOTHES MOTHS	GRAIN OR OTHER MOTHS
Size	
Very small, about 1/3 inch long, wings about ½ inch across.	Same size or larger; if larger, not a clothes moth, except for tapestry moth below.
Color	
Very pale yellowish, usually without markings; hind wings rounded, sometimes with three small black spots on each wing; the very rare tapestry moth is one inch across, with a white head, wings black at base, white at tips. If spotted, banded, or striped,	but not as in opposite column, see December, page 30 for grain moths. If small, pale yellow, with very narrow pointed hind wings with a wide fringe, as above, Angoumois grain moth, Dec., page 30. If not a grain moth, then probably just a visitor attracted by light.
Food	
Animal products mostly: wool, fur, feathers and their products; occasionally dead insects, fish, flour, etc.	Mostly cereal products, if breeding indoors, and other vegetable foods.
Habits	
Seldom flying around lights, usually avoiding light; poor flyers; closets, attics, furnished rooms.	Flying around lights; abundant near kitchens or pantries or where food is stored; on or near doors or windows.

It pays to control
bad odors
after pest control

Any insecticide that leaves an offensive odor can create ill-will and lose business.

Remove odors quickly by using Aireactor—the new deodorizer—right after applying any odorous insecticide or chemical. Also ideal for the quick dissipation of **smoke** odors after a fire. It's a good way to build good will!

Aireactor is a clear, non-flammable solution formulated from rare non-toxic elements found in plant life. It destroys odors instead of masking them—leaving the air fresh and clean-smelling.

Aireactor can be used indoors as a spray, or in air conditioners, air ventilating systems or mechanical ventilators; or applied outdoors in a fogging machine or spray gun. And it is economical—a little does a big job!

Get the full Aireactor story now—it can save you money. Send for free folder on odor control.

AIREACTOR CORP., 22 E. 40th ST., N. Y. 16, N. Y.

AIREACTOR
SPACE DEODORIZER
NATURE'S PRESCRIPTION FOR FRESHENING AIR

GOOD LOOKING CASES ADD PRESTIGE TO YOUR JOB!

Standard	Round	Special No. 3
18"x12"x7"	25"x8½" dia. for 3 gal. tank-type sprayer	18"x8"x10½"
$10.85	**$10.85**	**$10.35**

Attractive . . . low-priced . . . and soundly constructed for long use, these cases represent an unexcelled value! Mail your ORDER TODAY!

All inside dimensions shown are approximate

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WORLD'S LARGEST PEST CONTROL COMPANY

MICE - GLUE

GETS MICE LIKE FLYPAPER GETS FLIES

7½ lbs. $1.00 per lb. 25 lbs. $.90 per lb.
100 lbs. $.80 per lb.

BIRD - REPELLENT

Keep Pigeons, Starlings and Other Birds from Buildings

7½ lbs., $1.00 per lb. 25 lbs., $.90 per lb.
100 lbs., $.80 per lb.

PEST CONTROL CHEMICAL CO.

324 Broadway Write for details Buffalo, N. Y.

"FOR 70 YEARS CHOICE FOR QUALITY THE WORLD OVER"

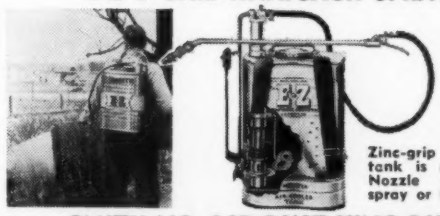
SMITH
SPRAYERS

Streamlined BLIZZARD Copper Continuous Sprayer

World's most beautiful copper, continuous sprayer. Pt. and Qt. (39 ounce) sizes. Glistening, solid copper tank. Pump barrel is highly polished, seamless brass. Modern design. Sturdy construction. Twin nozzles for spraying fine fog mist straight ahead or at an angle. Sprays any liquid.

SMITH NEW STREAMLINE BLIZZARD CONTINUOUS SPRAYER

E-Z 5 GAL. KNAPSACK SPRAYER



Finest knapsack sprayer made. Pump lever develops powerful pressure. Seamless brass pump. Brass valves. Zinc-grip steel or copper tank is air conditioned. Nozzle adjustable for spray or long stream.

SMITH NO. 16D DUST KING DUSTER
(Quart Size)

Precision built. Long extension tube. Non-clog nozzle is adjustable. Easy working plunger assures even dust blast. Popular for every dusting purpose.

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D. B. SMITH & CO., 440 Main St., Utica 2, N. Y.

Classifieds

When answering ads where box number only is given, please address as follows: Box number, c/o Pest Control, 1900 Euclid Avenue, Cleveland 15, Ohio.

Rates: "Position Wanted" 5c per word, minimum, $1.00. All other classifications, 10c per word, minimum $2.00 All classified ads must be received by Publisher at least three weeks preceding publication date and be accompanied by cash or money order covering full payment.

HELP WANTED

Experienced serviceman with salesmanship capabilities. Salary and commission. This is a permanent position with an old established firm located in the Midwest. Send full details in first letter to H. Cox, 512 E. 25th St., Indianapolis, Ind.

World's largest pest control firm, operating in 28 states from coast to coast, needs several high-caliber men for responsible positions. Must have initiative, good judgment, the ability to work and deal with people, and should be personally ambitious. Experience in professions related to pest control helpful. Liberal salary and incentive arrangements provide excellent opportunities with progressive and well established firm. Employee benefits include paid vacations, sick leave, life insurance, hospitalization and pension plan. Training programs for our future managers and other supervisory positions also open to college graduates. All replies confidential. Contact Technical Department, Orkin Exterminating Company, Inc., 713 W. Peachtree Street, N.E., Atlanta, Georgia.

One of the oldest and largest pest control firms in the East, operating over a large area, has career opportunities for several high caliber men with ambition and management ability. Practical experience in pest control or related professions helpful though not essential. Liberal salary and incentive plan offer the opportunity for an excellent financial future in a growing and progressive organization. We are also interested in replies from college graduates who would like to enter the industry. All replies will be held strictly confidential. Write in full detail to President, Bliss Exterminating Co., Inc., 151 Lexington Ave., New York 16, N. Y.

A large and dynamic pest control company operating over a large area in the East needs a qualified man to head its termite division. Duties: General direction of entire operation including supervision of a multi-crew organization, responsibility for operating and technical procedure, hiring and training of crews, etc. Will pay top salary for right man. This is a career opportunity offering a fine future. All replies will be held strictly confidential. Please write in detail experience and technical background to President, Bliss Termite Control Corp., 151 Lexington Ave., New York 16, N. Y.

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- Everyone is Moth and Carpet Beetle Conscious;
- Valuable Rugs and Carpets are being protected from Moth and Carpet Beetle damage;
- Large Profits are being made by aggressive **PCO's** who are mothproofing and giving **PER-MO'S 5-YEAR** Written Guarantee.

PER-MO MOTHPROOFING INCREASES YOUR PROFITS!

Most PER-MO dealers easily show **500% PROFIT** on Mothproof Service Work . . . In addition, we help you sell Mothproofing by giving you **FREE** envelope stuffers and other dealer aids.

We give your customers a **WRITTEN GUARANTEE** that their rugs and carpets won't be damaged by moth or carpet beetle larvae for at least **5 YEARS** . . . In case of damage, **PER-MO** assumes **100% OF LIABILITY**.

Water base type of liquid, **EASY-TO-USE,** harmless, **WILL NOT SPOT OR STAIN** . . . Odorless, and causes **NO INCONVENIENCE** while Mothproofing in a home.

—Some Other PER-MO Products—
● Flameproof Liquid ● Arsenic Rat and Mice Liquid ● Red Squill Rat Bits and Rat Paste ● Antu Rat Paste ● "Chek" Deodorant

PER-MO STANDS THE TEST IT'S BY FAR THE BEST

WRITE TODAY FOR FULL DETAILS On any or all products!

OUR 21ST YEAR

PER-MO PRODUCTS CO.
Dept. P. 63, 1715 E. 35 St., Kansas City, Mo.

POSITION WANTED

A northern experienced pest control serviceman wants position in South, due to family health reasons. Can do general pest control, supervise, and do selling. Can furnish bank or character references. Age 52, health excellent, church Methodist, Lodge F & A M (Mason). Box 395 Pest Control magazine.

Pest control salesman, 10 years experience with one of largest companies. Have sold over $150,000 individually in contracts last six years. Would like to buy into aggressive, reliable company in western state. Box 396 Pest Control magazine.

WANT TO BUY

Small exterminating route in New York City area. Highest price paid. Box 394 Pest Control magazine.

FOR SALE

Well established pest control route, locations in seven counties. Ideal for termite work along with route. No equipment to buy. Bill Hartman, Cuero, Texas.

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Sturgeon Again Heads Ky. PCA

J. Harvey Sturgeon, Sturgeon Pest Control, Louisville, has been re-elected president of the Kentucky Pest Control Association. Other organization officers are: vice president, O. L. Meyers, Kentucky Terminix Co., Louisville; secretary-treasurer, Clem Lindsey, Lindsey Pest Control, Louisville; and directors, Elmer Jones, Jones Pest Control, Owensboro; and Ace Johnson, Ashland.

The new officers were elected at the association's second annual convention held in Lexington recently.

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POSITIVE: It is a physical impossibility for birds to roost in the area where formula is applied.
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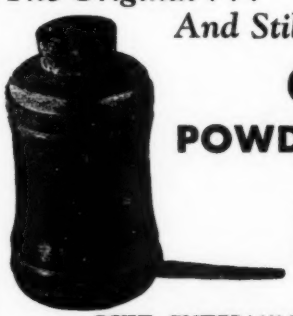

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1 GALLON UNIT offered for the first time
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A 1-gallon unit that is frankly the best value we have ever offered in a sprayer.
And, if you already own a PCE tank-type sprayer, you'll be glad to know that spare parts are interchangeable with other stainless steel tank-type sprayers in the PCE line.

AS ILLUSTRATED **$26.50**

WITHOUT GAUGE **$24.50**
as shown plus coupler at valve end of hose **$30.00**

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NAPESCO'S
EAT-KIL
(Pivol in a highly acceptable grain base)

New* Ready to Use Tastier Rat and Mouse Bait

*Bait based upon research studies at Purdue University, especially developed for the pest control industry and made with table-grade quality foods.

½ lb. pkg.	$ .47 (48 per carton)	25 lb. pkg.	$ .35 lb.
1 lb. pkg.	.67 (24 per carton)	50 lb. pkg.	.33 lb.
3 lb. pkg.	1.83 (8 per carton)	100 lb.	.32 lb.

Freight paid on orders over 150 pounds — Write for quantity prices

BAIT STATIONS

No. 1 Large Round Rat Station 14" diameter, 5½" deep **$1.60 each**
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All Metal Equipped with Swivelling Self-Feeder

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Pestales

Better at finances. *Tom Graham, of Graham Pest Control in Oklahoma City, tells us this one. Seems he, Harold Schorrenberg of Dead Shot Chemical in Oklahoma City, and Jim Cole, top man at Miracle Laboratories in Frederick, took their employees on an all-expenses paid fishing trip to Lake Texoma. Tom says Harold may be a wonderful secretary-treasurer for the NPCA, but is a lousy fisherman. "Wink" Cole and Harold shared a boat and came in with 29 fish: 28 for Cole, 1 for Schnorrenberg. We feel pretty good about the outcome knowing we ain't got no "angler" taking care of our association's moola.*

* * *

Anything for a Vote: Now that elections are coming up again politicians are frantically searching for some way to please their constituents. Recently a councilman in a small Midwestern town finally got around to investigating complaints that rats were overrunning the city dump. He went down to the dump to investigate for himself. Next day he reported to fellow councilmen that a large rat had attacked him, forcing him to flee for some distance before he was finally able to kill it with a stone. Councilman, are you sure that was a rat or just a political opponent in disguise?

* * *

Girl No. 3. *The Joe Grosses, of Tampa, Fla., recently announced the arrival of their third daughter, Kimberly Louise, who can join her sisters Pamela and Renee when they grow up, and mother Faye, helping pop in the office, but so far no prospects for additional routemen. PCO Joe is a frequent contributor of valuable articles that appear in our Notebook series.*

* * *

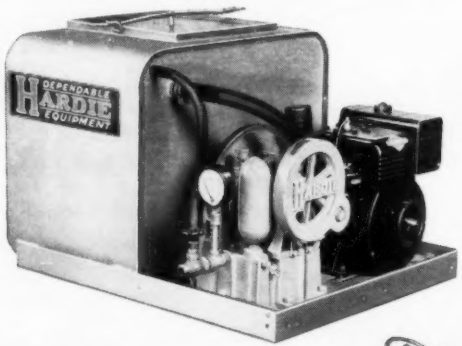
Watch Your Language, Sir! A mid-western lady recently found moths were making off with her winter wardrobe. She called a pest control firm who suggested de-mothing the entire house. "Will that spoil my food?" she wanted to know. "No contamination at all," the PCO said. "Everything will be all right." "What about my house plants?" The PCO said please don't worry. "Lady," he told her, "what we're going to do to your home won't even hurt a flea."

* * *

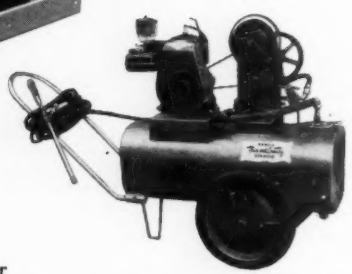
Kept in stitches. *M. Parcells, major-domo at Minx Products that tailors tarps for PCO-fumigators, has been sewing night and day to keep up with orders for every size and shape imaginable. One job called for the largest tarp ever made in this country.*

* * *

Free Loaders: Shivering rats in Canada's chilly British Columbia have found a way to escape the cold. They play piggyback with sheep. Farm managers in that area say it's not unusual to find three to five rats nestling on the backs of every sheep. That must be the original "central heating system."



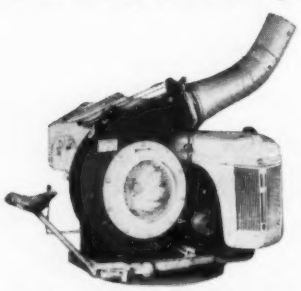
● This Hardie No. 99 delivers 4 gpm at 400 psi. Easily converted to low pressure. Skid model shown. Also available as engine powered trailer, tractor powered trailer and as pump and engine unit. Tanks are 25, 50 or 100 gal., as desired. Sturdy. Dependable. Universally popular. Use the coupon.



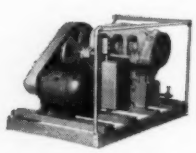
A Sprayer That Fits Your Job

● You can find exactly the sprayer for any purpose, at the price you want to pay, in the big Hardie line of high and low pressure pest control sprayers. Hardie builds more sizes and models of sprayers than any other manufacturer—the biggest sprayers built are Hardies. Ask your dealer or write for the big Hardie catalog. Use the coupon.

● This Hardie Town and Country Sprayer delivers 3 gpm at pressure adjustable from 20 psi to 250 psi. Available in pushcart (shown) skid and engine powered trailer models. 15, 50 or 100 gal. steel tank as desired. Piston-type pump just like the big Hardies. A splendidly versatile, rugged, dependable sprayer. Use the coupon.



● The outstanding machine for shade and forest tree pest control is the Hardie Aero Mist Sprayer. It easily covers the tallest trees. No drip, drift nor run off. Leading tree men use fleets of them. Two sizes. Use the coupon.



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Series B No. 1½ — Complete as pictured. The pump is rated at 2 gallons per minute at zero p. s. i. The motor is 1/3 h. p. Total hose, 112 feet, inside diameter ¼". Pressures up to 150 p. s. i., regulated by hand wheel adjustment. Large-screen suction strainer. Pressure gauge. Quick coupling hose connectors. Shut-off valve, three different capacity nozzles, 18" extension wand, motor-mounted electric toggle switch, 6' neoprene cord with armored plug, renewable hose end adapters, all brass nipples, bushings, cross fittings and elbows.

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Fittings for two-man operation, Series B No. 1½ (as pictured).

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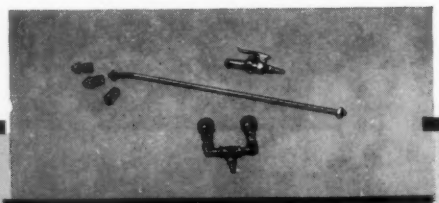
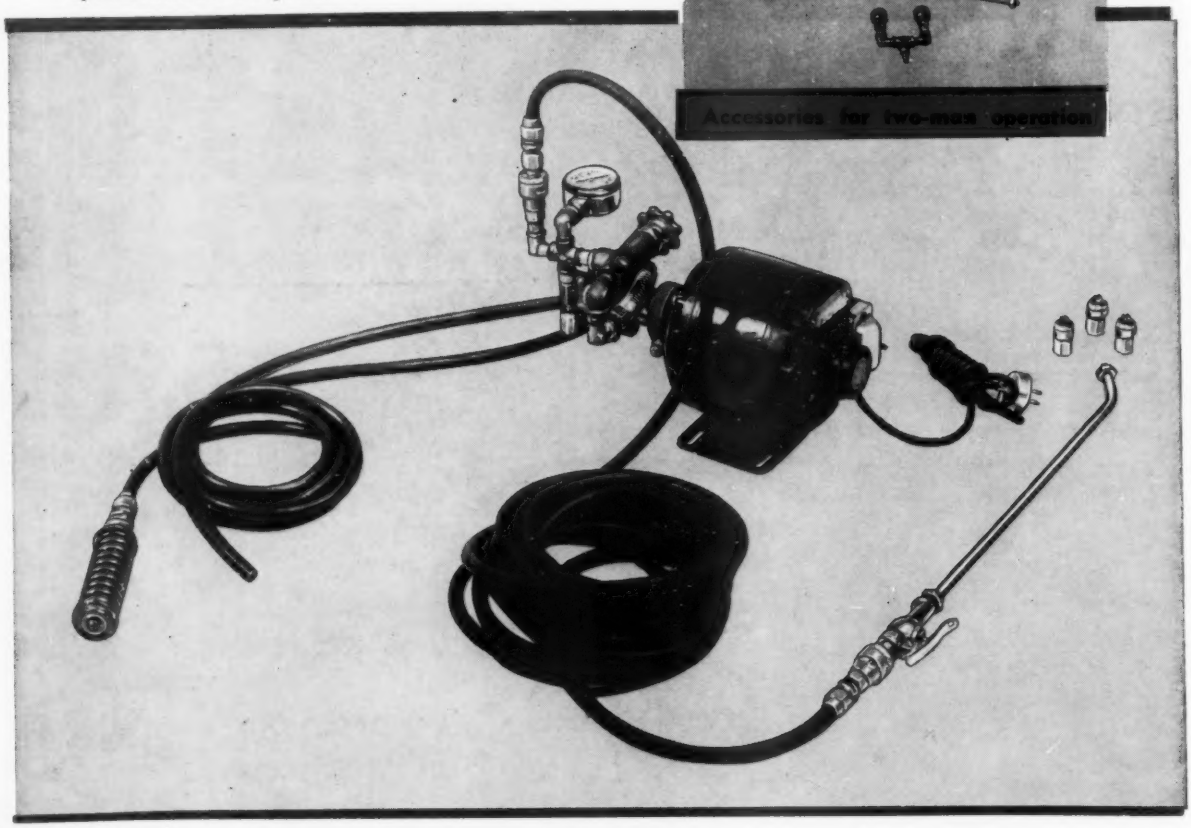


Accessories for two-man operation



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